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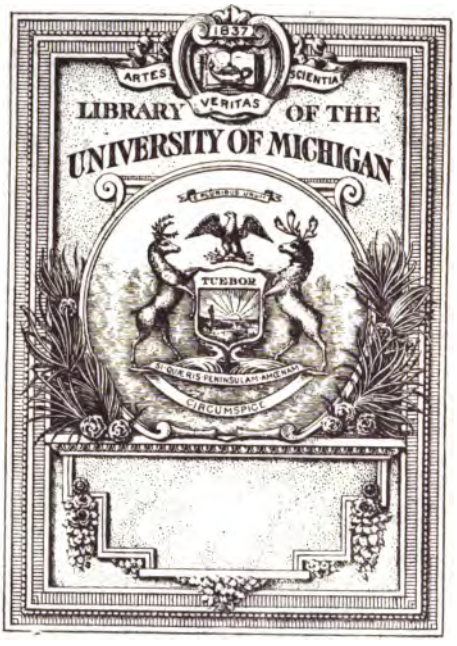
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FEDERAL TRADE COMMISSION

REPORT

ON THE

PRICE OF GASOLINE

IN 1915

▽

APRIL 11, 1917

WASHINGTON
GOVERNMENT PRINTING OFFICE
1917

FEDERAL TRADE COMMISSION.

WILLIAM J. HARRIS, *Chairman.*
WILL H. PARRY.
JOSEPH E. DAVIES.
WILLIAM B. COLVER.
JOHN F. FORT.

LEONIDAS L. BRACKEN, *Secretary.*

FEDERAL TRADE COMMISSION

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REPORT

ON THE

PRICE OF GASOLINE

IN 1915

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GOVERNMENT PRINTING OFFICE
1917

CONTENTS.

Page.

Letter of transmittal xv

SUMMARY.

Production of crude oil and gasoline 1
Stocks of crude oil and gasoline 2
Demand and exports 3
Position of the Standard companies in the industry 5
Division of territory and competition 6
Inequalities in price 9
Costs and margins 11
Earnings and stock quotations 14
Résumé 16
Remedies 16

CHAPTER I.—INTRODUCTION.

Sec. 1. The advance in gasoline prices 19
Wholesale prices 19
Retail prices 20
2. Complexity of the causes of the advance in gasoline prices 21

CHAPTER II.—DEMAND AND SUPPLY.

I. Demand for gasoline:
Sec. 1. General character of demand for gasoline 28
2. Statistics of demand for gasoline for motor purposes 29
3. Sales of gasoline by refiners 31
4. Exports 31
5. Export prices 34
6. Low demand during winter of 1914–15 followed by an increase 37
7. Effect of high prices on demand 39
II. Supply:
Sec. 8. Production and stocks of gasoline products, 1914 and 1915 40
9. Stocks and production of crude oil 41
10. Supply conditions and the recent advance in prices 42
11. Deterioration in the quality of gasoline 44
12. Cost of refining 45
(A) Cost of crude oil:
Decrease in production 45
Alleged control of crude production and price 47
Relation between crude-oil supply and crude-oil prices 47
Increase in stocks 48
(B) Cost of materials 50
(C) Deterioration in quality of crude 51
(D) Larger share of expenses borne by gasoline:
Gasoline becomes main product; others sometimes by-products 52
Relative advances of gasoline and other petroleum products 53
13. Minor factors affecting supply 55
III. "Demand and supply" and the advance in gasoline prices 56

3171

CHAPTER III.—COSTS AND MARGINS.

Page.
Sec. 1. Introduction 59
2. Outline of the technical process of refining crude oil 60
The distillation process 60
Naphtha or gasoline 61
Kerosene and fuel oil 61
Wax 61
Lubricating oil 62
Coke 62
Pressure stills 62
I. Relative movements of cost of a gallon of crude oil and of the value of the refined products of a gallon of crude:
Sec. 3. Relative movements of cost of crude oil and of its chief refined products, based on average refinery prices as reported to the Commission 63
Mixed Appalachian and Mid-Continent crude 64
Appalachian crudes 66
Mid-Continent crude 67
Cushing crude 68
California crude 69
Mixed Mid-Continent and Gulf coast crude 70
General conclusion concerning relative advances of crude oil and refined products 72
II. Complete costs from the books of representative refiners:
Sec. 4. Methods of computing gasoline costs 73
Method of computing average specific cost 74
Method of joint production, or by-product cost 74
5. Refineries covered in special cost investigation 76
6. Average specific cost of gasoline 76
Monthly average specific cost of gasoline for seven representative refineries 79
7. Total average cost per gallon of all products 84
8. Cost of gasoline, based on "by-products method" 85
Costs and margins per gallon of gasoline produced; six-month averages 85
Cost and margins per gallon of gasoline produced; for three refineries which produced no lubricating oils, six-month averages 90
Costs and margins per gallon of gasoline produced; monthly average 91
Margins per gallon of gasoline sold 94
9. Monthly margins per gallon of crude oil 95
10. Summary concerning costs 99

CHAPTER IV.—EARNINGS, DIVIDENDS, AND QUOTATIONS ON THE STOCKS OF REPRESENTATIVE REFINING AND MARKETING COMPANIES.

Sec. 1. Earnings and dividends of representative companies 101
Investment 106
Net earnings 106
Dividends and surplus 107
Net earnings and dividends, 1913–1915 108
2. Quotations of the stocks of refining and marketing companies 110

CHAPTER V.—INEQUALITIES IN COMPETITION AND PRICE.

		Page.
General survey of inequalities:		
Sec. 1.	Comparison of prices in the various Standard marketing territories	113
	Differences not required by general demand and supply conditions	113
	Comparison of price movements at representative points	114
2.	Inequalities in the prices of other companies	118
3.	Quality of gasoline in different sections	119
4.	Conclusion concerning general inequalities in price	121
The Standard of Indiana and the "independent" jobbers:		
Sec. 5.	Purchases of Oklahoma crude oil by Standard of Indiana	123
6.	Prices made by the Standard of Indiana during 1915	123
7.	Sales to other Standard companies, and prices in their territories.	128
8.	Conclusion concerning conditions in Indiana territory	129
9.	Purchases of gasoline by Standard companies from Mid-Continent "independent" refiners	131
10.	Inequality of prices between Ohio and Indiana territories	134
	The difference not based on cost	134
	Standard of Indiana prices in September, 1915, too low	135

CHAPTER VI.—RETAIL PRICES AND MARGINS.

CHAPTER VII.—POSITION OF THE STANDARD COMPANIES IN THE INDUSTRY.

Sec. 1.	Dominant position of the Standard companies in their several marketing territories	143
2.	Community of interest through common-stock ownership	144
3.	Effect of community of interest on competition	146
	Industry-combination and its effect on competition	146
	Division of territory among noncompeting refining and marketing companies	148
4.	Arguments of Standard representatives in defense of the existing situation	150
5.	The power of Standard companies to make prices—Testimony of competitors	155
6.	Territorial division and the dissolution decree	158

CHAPTER VIII.—CONCLUSIONS AND RECOMMENDATIONS.

Sec. 1.	Summary of facts and conclusions:	
	Supply, demand, and prices	159
	Division of territory and community of ownership	160
	Pipe-line control	160
	Publicity of correct statistics	161
	Quality of gasoline	162
2.	Recommendations:	
	(1) As to common ownership	162
	(2) As to pipe line control	164
	(3) As to publicity of statistics	164A
	(4) As to quality of product	164A

STATISTICAL EXHIBITS.

PART 1.

Independent refiners and jobbers covered by the report: Page.
Refiners.... 165
Jobbers.... 167

PART 2.

Data upon which diagrams showing price inequalities are based.... 169

PART 3.

General statistical exhibits.... 183

LIST OF TABLES.

I. Total horsepower of gasoline engines sold by manufacturers reporting to the commission, 1913, 1914, 1915.... 4
II. Intercompany purchases of gasoline by specified Standard companies, 1915 8
III. Average tank-wagon prices of gasoline, freight deducted, in specified States representing Standard territories, January, July, and December, 1915.... 9
IV. Average advances in cost of crude and price of products, July to December, 1915.... 12
V. Costs (allowing for gains and losses on other products), prices, and margins per gallon of gasoline produced at representative refineries, by six-month periods, 1915, and by months July to December, 1915.... 13
VI. Per cent of net earnings on total net investment for 24 representative refining and marketing companies, 1915.... 15
1. Monthly average tank-wagon prices of gasoline in specified States, 1915.. 20
2. Monthly average retail prices of gasoline, chiefly at garages, in specified States, 1915.... 20
3. Summary of domestic sales and horsepower of motors requiring gasoline for motive power, 1913, 1914, and 1915.... 30
4. Sales of gasoline and naphtha by refiners reporting to the commission, 1913–1915.... 31
5. Exports of gasoline products (gasoline, naphtha, and benzine combined), 1913, 1914, and by months, 1915 and 1916.... 32
6. Exports of gasoline products as reported to the Federal Trade Commission, 1914 and 1915.... 33
7. Monthly average export and domestic prices of gasoline, F. O. B. refinery, as reported by the Standard of New Jersey, 1915.... 35
8. Monthly average export prices of gasoline, 1914 and 1915.... 36
9. Quantity of gasoline products (gasoline and naphtha) produced by refineries reporting to the Commission, by months, 1915.... 40
10. Stocks of gasoline products (gasoline and naphtha) held by refiners and jobbers reporting to the Commission, by months, 1915.... 41
11. Stocks of crude oil on hand, production of crude oil, and estimated gasoline content of crude oil produced, by months, 1915.... 42
12. Monthly average posted price of Pennsylvania crude oil at the wells and monthly average eastern prices of refined products (refinery prices), 1915.... 54
13. Monthly average posted price of Kansas-Oklahoma crude oil at the wells and monthly average Mid-Continent prices of refined products (refinery prices), 1915.... 54

Page.

14. Relative movement of the monthly average cost of a gallon of crude oil, at the refinery, and of the average prices of the chief products of a gallon of crude oil, as computed from reports of refiners of mixed Mid-Continent (including Illinois and Appalachian) crude to the Commission, 1915 65
15. Relative movement of the monthly average cost of a gallon of crude oil and of the average prices of the chief products of a gallon of crude oil, as computed from reports of refiners of Appalachian crude to the Commission, 1915 66
16. Relative movement of the monthly average cost of a gallon of crude oil at the refinery, and of the average prices of the chief products of a gallon of crude oil, as computed from reports of refiners of Mid-Continent crude to the Commission, 1915 67
17. Relative movement of the monthly average cost of a gallon of crude oil at the refinery, and of the average prices of the chief products of a gallon of crude oil, as computed from reports of refiners of Cushing crude ("skimming plants") to the Commission, 1915 68
18. Relative movement of the monthly average cost of a gallon of crude oil at the refinery, and of the average prices of the chief products of a gallon of crude oil, as computed from reports of refiners of California crude to the Commission, 1915 70
19. Relative movement of the monthly average cost of a gallon of crude oil at the refinery, and of the average prices of the chief products of a gallon of crude oil, as computed from reports of mixed Mid-Continent and Gulf coast crude refiners to the Commission, 1915 71
20. Average specific coast of producing a gallon of gasoline at seven representative refineries, by six-month periods, 1915 77
21. Monthly average specific costs, prices, and margins per gallon of gasoline, for seven representative refineries, by months, July–December, 1915 .. 80
22. Average specific coast of gasoline and the average of total refining costs per gallon of all products (including gasoline) for representative companies, by six-month periods, 1915 84
23. Total average cost, average value, and average margin per gallon of gasoline produced, treating products other than gasoline as by-products, for six representative refineries, six-month periods, 1915 86
24. Margin per gallon of gasoline, Atlantic Refining Co. (Philadelphia refinery), gains on other products not added 88
25. Total average cost, average value, and average margin per gallon of gasoline produced at the Standard of Ohio's refinery, treating products other than gasoline as by-products, six-month periods, 1915 88
26. Total average cost, average value, and average margin per gallon of gasoline produced, treating products other than gasoline as by-products, for three refineries which produced no considerable quantity of lubricating oils, six-month periods, 1915 90
27. Total average cost, average value, and average margin per gallon of gasoline produced, treating products other than gasoline as by-products, for specified refineries, by months, July–December, 1915 91
28. Monthly average margin between total refinery cost per gallon of crude and the price of the products, from a gallon of crude, for representative Standard refineries, 1915 96
29. Monthly average margins between total refinery cost per gallon of crude and the price of the products, from a gallon of crude, for representative "independent" refineries, 1915 97

Page.

30. Average monthly refinery costs per gallon of crude oil consumed at the Sugar Creek and Whiting plants of the Standard of Indiana, compared with average monthly prices of all products from a gallon of crude, by months, July–December, 1915 98
31. Capital, surplus, net earnings, and dividends of 24 representative refining and marketing companies, arranged according to ownership and character of chief operations, 1915 102
32. Per cent of net earnings on investment and of dividends on capital stock and surplus for 24 representative refining and marketing companies, 1913–1915 108
33. Monthly average tank-wagon prices of gasoline in specified States representing specified Standard marketing territories, freight deducted 117
34. Sales of gasoline and naphtha to Standard companies by Mid-Continent independent refiners who reported sales to Standard companies in 1915. 132
35. Standard of Indiana's average refinery price and average "net back" on sales in Indiana, Ohio, and Kentucky territories, 1915 136
36. Average monthly tank-wagon price, retail price, and margin on gasoline in Standard marketing territories, by specified months, 1915 139
37. Estimated percentages of the total quantity of gasoline sold in the several Standard marketing territories by the several Standard companies operating therein during 1915 144

LIST OF DIAGRAMS.

Facing page.

Relative movement of the average monthly domestic and export prices of gasoline, f. o. b. refinery, received by the Standard Oil companies of New York and New Jersey, 1915 (diagram 7) 36
Export prices of gasoline products compared with the monthly average tank-wagon prices at New York City, 1915 (diagram 8) 36
Marketed production, stocks, and prices of crude oil in the Kansas-Oklahoma fields, by months, 1909–1915; total production of Kansas-Oklahoma crude oil, excluding Healdton, 1914–1915; and prices of 60°–61° gasoline, f. o. b. Kansas-Oklahoma refineries, 1914–1915 (diagram 9) 48
Relative movement of stocks, sales, and production of gasoline, and stocks of crude oil by all refining companies reporting to the commission, 1915 (diagram 10) 57
Relative movement of stocks, sales, and production of gasoline, and stocks of crude oil: Standard refining companies, 1915 (diagram 11) 58
Relative movement of stocks, sales, and production of gasoline, and stocks of crude oil: Other refining companies, 1915 (diagram 12) 58
Relative movement of tank-wagon prices, with freight deducted, made by several Standard companies at specified points in the United States (diagram 1) 115
Relative movement of tank-wagon prices, freight deducted, made by specified companies at specified points, 1915 (diagram 13) 116
Relative movement of tank-wagon prices, freight deducted, made by specified companies at specified points, 1915 (diagram 14) 116
Relative movement of tank-wagon prices, freight deducted, made by specified companies at specified points, 1915 (diagram 15) 116
Relative movement of tank-wagon prices, with freight deducted, made by several Standard companies at specified middle western and eastern points (diagram 2) 117
Relative movement of tank-wagon prices, freight deducted, made by specified companies at specified points, 1915 (diagram 16) 117

Facing page.
Relative movement of tank-wagon prices, freight deducted, made by specified companies at specified points, 1915 (diagram 17) 117
Relative movement of tank-wagon prices, freight deducted, made by specified companies at specified points, 1915 (diagram 18) 118
Relative movement of tank-wagon prices, freight deducted, made by specified company at specified points, 1915 (diagram 19) 118
Relative movement of tank-wagon prices, with freight deducted, made by the Texas Co. at specified points (diagram 3) 118
Relative movement of tank-wagon prices, with freight deducted, made by the Gulf Refining Co. at specified points (diagram 4) 119
Relative movement of tank-wagon prices, freight deducted, of the Standard of Indiana and an independent jobber at Kansas City, Mo., 1915 (diagram 22) .. 127
Relative movement of tank-wagon prices, freight deducted, of the Standard of Indiana and an independent jobber at Waterloo, Iowa, 1915 (diagram 23) ... 127

MAP.

Division of territory among Standard companies marketing gasoline in the United States in 1915 22

STATISTICAL EXHIBITS.

Page.
TABLE 1. Data upon which diagram 1, facing page 115, is based, together with information concerning costs, competition, and kind of gasoline marketed at specified points 169
2. Data upon which diagram 2, facing page 117, is based, together with information concerning costs, competition, and kind of gasoline marketed at specified points 171
3. Data upon which diagram 3, facing page 118, is based, together with information concerning costs, competition, and kind of gasoline marketed at specified points 172
4. Data upon which diagram 4, facing page 119, is based, together with information concerning costs, competition, and kind of gasoline marketed at specified points 174
5. Data upon which diagram 13, facing page 116, is based, together with information concerning costs, competition, and kind of gasoline marketed 175
6. Data upon which diagram 14, facing page 116, is based, together with information concerning costs, competition, and kind of gasoline marketed 176
7. Data upon which diagram 15, facing page 116, is based, together with information concerning costs, competition, and kind of gasoline marketed 177
8. Data upon which diagram 16, facing page 117, is based, together with information concerning costs, competition, and kind of gasoline marketed 178
9. Data upon which diagram 17, facing page 117, is based, together with information concerning costs, competition, and kind of gasoline marketed 179
10. Data upon which diagram 18, facing page 118, is based, together with information concerning costs, competition, and kind of gasoline marketed 180
11. Data upon which diagram 22, facing page 127, is based, together with information concerning costs, competition, and kind of gasoline marketed 181

Page.

TABLE 12. Data upon which diagram 23, facing page 127, is based, together with information concerning costs, competition, and kind of gasoline marketed 182
13. Production (barrels) of crude oil in various fields of the United States, by months, 1914 and 1915 183
14. Relation of the production of the Cushing pool to the combined production of light crudes (California and Gulf coast crudes omitted), by months, 1915 185
15. Stocks (barrels) of crude oil of specified fields in storage and in pipe lines, as reported to the Federal Trade Commission, at the end of each month, January, 1915, to March, 1916, inclusive 185
16. Stocks of crude oil in Mid-Continent field in Standard and other pipe lines and in tanks of Standard and other producing companies, January, 1915, to March, 1916, inclusive 186
17. Stocks of crude oil in Illinois and Eastern fields in Standard and other pipe lines, and in storage with such lines, January, 1915, to March, 1916, inclusive 187
18. Stocks of crude oil in Standard pipe lines and tanks and in allied producing companies' tanks and in other pipe lines and producers' tanks in Mid-Continent and Illinois and Eastern fields, as reported to the Federal Trade Commission, January, 1915, to March, 1916, inclusive 187
19. Crude-oil stocks held by the Carter Oil Co., Prairie Oil & Gas Co., and other Oklahoma producers, January, 1915, to March, 1916, inclusive 188
20. Crude oil held in storage for producers by eastern pipe line companies reporting to the Commission, January, 1915, to March, 1916 188
21. Stocks of crude oil held by Standard and other refineries reporting to the Commission, January 1, 1915, July 1, 1915, and January 1, 1916 188
22. Combined stocks of crude oil held by pipe lines, producers, and refiners reporting to the Commission, January 1, 1915, July 1, 1915, and January 1, 1916 189
23. Number of oil wells drilled in the various oil fields in the United States, January 1, 1913, to April 1, 1916 189
24. Estimated gasoline content (gallons) of the crude oil produced in the United States during 1915 190
25. Quantity of gasoline produced by refineries reporting to the Commission, by months, 1915 191
26. Purchases of gasoline (gallons) by all refiners and jobbers reporting to the Commission, by months, 1915 192
27. Stocks of gasoline (gallons) held by refiners and jobbers reporting to the Commission at the beginning of each month, January 1, 1915, to January 1, 1916, inclusive 192
28. Gross sales of gasoline (gallons) by all refiners and jobbers reporting to the Commission, by months, 1915 193
29. Sales of gasoline and naphtha (gallons) by refiners to jobbers and consumers by all refiners reporting to the Commission, by months, 1915 193
30. Exports of gasoline, naphtha, and benzene (combined), by months, 1915 194
31. Exports of gasoline, naphtha, and benzene (combined) by various refiners reporting to the Commission, together with percentages of the total, 1914–1915 194

Page.

TABLE 32. Number of gasoline engines sold in foreign and domestic markets by 270 manufacturers reporting to the Commission, together with the total horsepower of such engines, 1913–1915..... 195
33. Monthly average f. o. b. refinery price of gasoline for refiners reporting to the Commission, by territorial groups, 1915..... 196
34. Monthly average Standard tank-wagon prices by Standard marketing territories and Standard tank-wagon prices minus freight by such territories and by States therein, 1915..... 197
35. "Net back" (tank-wagon price minus freight and marketing cost) on sales by Standard and other companies in the various Standard marketing territories, 1915..... 201
36. Average tank-wagon prices, retail prices, and retail margins in representative towns in various Standard marketing territories, and representative States therein, by months, 1915..... 207
37. Monthly average refinery yields, prices, and losses, showing a comparison between changes in the cost of crude oil and in the price of the products secured from a gallon of crude oil, based on market quotations and average yields of large eastern refineries, 1915.... 218
38. Monthly average refinery yields, prices, and losses, showing a comparison between changes in the cost of crude oil and in the price of the products secured from a gallon of crude oil, based on market quotations and average yields of Mid-Continent refineries, 1915.. 219
39. Costs, weighted average prices of combined products, and margins per gallon of crude, computed from the reports to the Commission and the books of the representative refiners, by months, 1915.... 221

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LETTER OF TRANSMITTAL.

FEDERAL TRADE COMMISSION,
April 11, 1917.

To the President of the Senate of the United States.

SIR: I have the honor to transmit herewith the final report of the Federal Trade Commission on the price of gasoline in 1915. This report is one of several already submitted or in process of preparation in the course of this commission's general investigation of the petroleum industry, pursuant to Senate Resolution 109, Sixty-third Congress, first session, and Senate Resolution 457, Sixty-third Congress, second session.

Respectfully,

WILLIAM J. HARRIS, *Chairman.*

SUMMARY.

In accordance with certain Senate resolutions the Federal Trade Commission is conducting an investigation of the petroleum industry in all its phases. During the latter part of the year 1915 numerous complaints from all parts of the country came to the Commission, charging that the price of gasoline was unreasonably high, and that gross discriminations in price were being practiced by refiners and others. These complaints were of such a character and so numerous that the Commission deemed it in the public interest to make a special investigation. This report is the result of that inquiry.

During the year 1915 there were marked changes in the price of gasoline, a fall in prices in the early part of the year being followed by an extraordinary advance. Though varying in different sections of the country, this advance may be roughly dated from July. Taking the wholesale (tank wagon) price as representative, the amount of the advance during the second half of the year was generally between 7 and 9 cents per gallon, a rise of from 75 to 85 per cent. In some parts of the country it was more than this; in others less. The advance in retail prices was similar in amount. (See p. 20.) If the contemporaneous decline in quality of gasoline is considered, the true advance is still greater. (See p. 51.) The principal facts concerning the gasoline situation and the conclusions based thereon are as follows:

PRODUCTION OF CRUDE OIL AND GASOLINE.

(1) Practically the entire supply of gasoline is made from crude oil, or petroleum. The production of crude oil in the United States was greater in 1915 than in 1914 (see p. 41) and showed no great decrease between the beginning and the end of the year 1915, though the production in the second half of the year was less than in the first half by some 3,972,000 barrels.[1] The total production in the United States in 1915 was about 306,000,000 [2] barrels, as compared with approximately 301,000,000 barrels in 1914.

(2) The monthly production of light (gasoline yielding) crudes, however, decreased considerably during 1915. This decrease was chiefly due to the decline in the output of the Cushing pool in Okla-

[1] This figure does not take account of 986,000 barrels, estimated quantity run by three independent refineries at Shreveport, La., which can not be segregated by months.

[2] See Statistical Exhibits, p. 184, Table 13.

homa, which produces a crude peculiarly rich in gasoline. This pool produced about 8,000,000 barrels in June, 1915, and 3,800,000 barrels in October. Its total production in 1915, however, was over 23,000,000 barrels greater than in 1914.[1]

(3) As a result of the foregoing fact, the estimated gasoline content of the crude produced in 1915 indicates a marked decline during the year. This estimate is made on the basis of the usual yields of gasoline from the crude oils produced in the several oil fields. The estimates of the gasoline content of the crude oil produced in January, July, and December, 1915, are: 175,608,000 gallons, 172,094,000 gallons, and 145,601,000 gallons, respectively.[2]

(4) The production of gasoline products as reported by refiners to the Commission[3] increased somewhat during 1915, the maximum monthly output coming in October. The total production for the year was over 1,548,799,000 gallons.

STOCKS OF CRUDE OIL AND GASOLINE.

(5) There was an unusual increase in the holdings of crude oil by various large producers and pipe-line companies during the latter part of 1915. In round numbers the stocks of Mid-Continent crude oil held by pipe lines and producers increased from 75,300,000 barrels in January to 100,650,000 barrels in October; and between the same months the total stocks of Pennsylvania, Lima-Indiana, Illinois, and Mid-Continent crudes, as compiled from the only available published sources, increased from 96,600,000 barrels to 125,525,000 barrels. The same trend is shown by statistics collected by the Commission showing crude oil held in storage for producers by the various smaller pipe lines serving the Appalachian field, their stocks rising from 743,000 barrels in January to 2,284,000 in November. This accumulation of stocks contributed appreciably to the increase in the price of crude and to the advance in gasoline crudes, caused chiefly by the decline in Cushing; various pipe-line companies, producers, and refiners, having the necessary financial resources, increased their holdings of crude oil, thereby increasing the effect of the decline in production on the scarcity of oil on the market. There was competition for crude which was held for higher prices, and refiners dependent upon current purchase from producers commonly found it necessary to pay premiums.

[1] See Statistical Exhibits, Table 13, p. 184.

[2] See Statistical Exhibits, Table 24, p. 190.

[3] Refiners reporting to the Commission include all important refiners in the United States, and probably cover over 90 per cent of the total output. Some small refiners which began business in 1915 are not included, and returns were not secured from a number of older concerns. These, however, were not large producers of gasoline.

Most large companies, however, both Standard companies and others,[1] increased their holdings of crude oil between the beginning and the end of 1915. The pipe lines and producing companies allied with the Standard group, however, during the first quarter of 1915 held over 66 per cent of the total crude in storage other than that held at refineries, and during the first quarter of 1916 held over 74 per cent; and the several Standard refineries combined held from 71 to 81 per cent of the total stock of crude oil at refineries covered by reports to the Commission. The stocks of crude oil held by such refiners showed a greater increase after July than those of other refiners. This, however, may have been due to an earlier appreciation of the tendency of the market or to the possession of greater financial resources. A more detailed analysis of the facts may be made from Tables 15–22 in the Statistical Exhibits pages 185 to 189.

The statistics of stocks of crude oil and of gasoline will be found on pages 40–42.

DEMAND AND EXPORTS.

(6) The chief element in the demand for gasoline is the internal-combustion engine. Inquiries by the Commission show rapidly increasing sales of all types of gasoline engines during the last three years. Over 270 manufacturers of motors or engines using gasoline as fuel have furnished information to the Commission concerning their sales. Though returns could not be secured from some who had gone out of business in 1916, and the figures consequently are too small for the earlier years, the data indicate an important increase

[1] The term "independents" is also used at times in this report to designate companies other than the several Standard companies. It is common in the business world, as well as in general practice, to distinguish two groups of interests in the petroleum industry; the one embracing the former subsidiaries of the Standard of New Jersey, which was a holding company, and its affiliations, and the companies controlled by them; the other embracing the so-called "independents." The Commission has followed this usage, designating one group "Standard companies" and the other "other companies," or "independents." The Standard companies producing or selling gasoline in the United States include the Standard Oil Co. (New Jersey); Standard Oil Co. of New York; Standard Oil Co. (Ohio); Standard Oil Co. (Indiana); Standard Oil Co. (Kentucky); Standard Oil Co. (Nebraska); Standard Oil Co. (Kansas); Standard Oil Co. of Louisiana; Standard Oil Co. (California); Atlantic Refining Co.; Vacuum Oil Co.; Solar Refining Co.; Continental Oil Co.; and the Magnolia Petroleum Co. The Carter Oil Co., controlled by the Standard of New Jersey, has recently constructed a refining plant in Oklahoma. The Magnolia Co. is largely owned by important stockholders in Standard companies (see footnote, p. 23), though the stock is in the hands of a trustee in accordance with the laws of Texas. Another refining company in which important stockholders in Standard companies have considerable interests (Tide Water Oil Co.) has not been classed as a Standard company. Various stockholders in the different Standard companies also own considerable holdings in The Texas Co., aggregating about 25 per cent. Of the various Standard companies there were three which did no refining, but were mere jobbers, the Standard Oil Co. (Kentucky), the Continental Oil Co., and the Standard Oil Co. (Nebraska). The "other companies" will be found listed in the Statistical Exhibits, p. 165. In all, the Commission has data from more than 90 refiners and 70 jobbers. Most of the "independent" refiners fall into four main groups: (1) Those located in or near Oklahoma and using Mid-Continent crude oil; (2) the two big Gulf coast companies—The Texas Co. and the Gulf Refining Co.—the latter controlled by the Gulf Oil Corporation; (3) various eastern refiners using Appalachian crudes and producing large percentages of lubricating oils; (4) California refiners, notably the Shell Co. of California, which is controlled by foreign interests.

in 1915 over 1914. A condensed table, showing the total horsepower of domestic sales, follows: [1]

TABLE I.—TOTAL HORSEPOWER OF GASOLINE ENGINES SOLD BY MANUFACTURERS REPORTING TO THE COMMISSION, 1913, 1914, 1915.

Year.	All gasoline engines, total horsepower.	Per cent increase.	Automobiles and motor trucks, total horsepower.	Per cent increase.
1913	[1] 11,279,143	.....	[1] 7,561,972	.....
1914	[1] 13,887,331	[1] 23	[1] 10,449,937	[1] 38
1915	22,524,858	[1] 62	17,263,382	[1] 65

[1] The figures for 1913 and 1914 are less than the total produced, and consequently the percentages of increase in 1914 and 1915 as they appear in the table are too large.

This table indicates that the horsepower of gasoline engines sold in 1915 was approximately 62 per cent above that of the engines sold in 1914.

(7) The sales of gasoline by refiners increased from the beginning of 1915 until September, remaining high thereafter until November, and, though decreased, were much higher in November and December than they had been in January of the same year. Returns from refiners reporting to the Commission show an increase of 38 per cent in sales of gasoline and naphtha to jobbers and consumers during 1915 as compared with 1914. This evidence of increased demand is borne out by reports from over 1,000 garages, scattered over every State in the Union, which show an increase of 16 per cent in total gallons of gasoline sold in 1915 over 1914.

(8) The exports of gasoline products (gasoline, naphtha, and benzine) were over 315,400,000 gallons during 1915 and 209,546,000 gallons during 1914, an increase in exports of over 50 per cent. These figures are compiled from the reports made to the Commission by practically all refiners in the United States.[2] The statistics of the Bureau of Foreign and Domestic Commerce indicate the movement of exports by months and show that they reached a maximum in August, 1915. (See p. 32.) The exports during the remainder of the year, however, show a decline. As reported by refiners to the Commission, 1915 exports were over 20 per cent of the gasoline and naphtha produced by the same refiners in 1915. In 1914 exports were approximately 18 per cent of the quantity manufactured. This increase in exports, though small compared with the total quantity produced, was one factor in causing the advance in the price of gasoline.

[1] For details, see Statistical Exhibits, Table 32, p. 195.

[2] The figures are somewhat greater than the statistics of the Bureau of Foreign and Domestic Commerce, and probably involve some duplication, but agree in general trend.

POSITION OF THE STANDARD COMPANIES IN THE INDUSTRY.

In using the terms "Standard" and "other" as applied to various refining companies, the Commission is adopting a generally accepted usage. An examination of the lists of stockholders of the various companies called "Standard" shows that they are owned by bodies of stockholders which are so similar in membership as to justify the common usage. This common ownership is in accord with the decree which dissolved the Standard Oil Co. of New Jersey in 1911. Throughout this report, though the several Standard companies are often treated as a group, this is not to be taken as obscuring the fact that they maintain separate organizations, including officers, directors, and refining and marketing machinery.

The figures presented in this report indicating the percentage of total production and stocks of crude oil and refined products of the Standard companies, are considered conservative, for the reason that several important companies are classed as "independent" though considerable parts of their stock are owned by stockholders in Standard companies.

(9) Throughout the year 1915 the pipe lines and producing companies allied with or controlled by the several Standard companies held in their possession approximately 65 per cent of the total quantity of the crude oil held by pipe lines and producers east of the Rockies; and their control increased to about 70 per cent in the latter part of the year. As already stated, they held from 71 to 81 per cent of the crude oil held by refineries during 1915.

(10) The refineries owned by what are clearly Standard companies produced over 60 per cent of the gasoline products produced in the United States during 1915 by refiners reporting to the Commission, which refiners embrace all the more important concerns in the United States; and these same refineries sold about 65 per cent of the total quantity of gasoline marketed, while their exports were approximately 83 per cent of the total exports in 1915. In August, 1915, the various Standard companies, refiners and jobbers, held 79 per cent of the stocks of gasoline, and in December, 1915, 76 per cent. As several large refining companies in which stockholders in Standard companies have considerable holdings have been classed as "independent," the percentages given are conservative.

(11) The several Standard companies have the power through their purchases and sales to exercise considerable control over the price both for crude oil and the products thereof. (*a*) The quotations, or "posted prices," announced by Standard concerns constitute (with rare exceptions) the "market" for crude oil in the Appalachian and Mid-Continent oil fields. Statements made to the Commission show that large buyers for "independent" oil companies, such as the Gulf Refining Co., follow the Prairie Oil & Gas Co. prices in Oklahoma. (*b*) The various

Standard companies, with relatively unimportant exceptions, in announcing their tank-wagon price of gasoline in any locality, practically fix the price that prevails. As a rule, and throughout most of the country, the prices announced by Standard concerns as the ones at which they will sell their products are carefully watched and are followed more or less closely by the so-called independents. (See p. 155f.)

The prices of gasoline in 1915 showed such inequalities and such divergent rates of increase in different sections of the country as to be incapable of explanation merely upon the basis of different costs of production and transportation or of local peculiarities of supply and demand. (See pp. 57f, 83, 89, 113, 119.) As no other agency apparently possessed sufficient power to produce such results, the conclusion seems justified that the division of the country into Standard marketing territories and the absence of effective competition in the sale of gasoline among these territories, were partly responsible for the inequalities.

The foregoing statements concern the general situation, and do not overlook the fact that in some localities similar inequalities, or discriminations, on the part of the so-called independent companies have existed. (See p. 118.)

DIVISION OF TERRITORY AND COMPETITION.

(12) The investigation establishes the fact that the several Standard companies have with respect to gasoline maintained a complete division of territory embracing the whole country and that almost without exception each Standard marketing company occupies and supplies a distinct and arbitrarily bounded territory. The map which accompanies this report (see p. 22), shows that the entire country is divided among various Standard companies and companies affiliated with them, and with one or two negligible exceptions, the territory occupied by one does not overlap with that occupied by another. Thus, the Standard Oil Co. of New York exactly occupies the New England States and New York, but no other State; the Atlantic Refining Co. exactly occupies Pennsylvania and Delaware, but no other State; the Standard Oil Co. (Indiana) exactly occupies a compact group of 10 North Central States, with a few stations in northern Oklahoma; and similar conditions obtain throughout most of the United States.

That these territories are properly characterized as "arbitrarily bounded" is clear from the fact that their boundaries generally coincide with State lines. State lines are political boundaries and seldom correspond to the areas that would be fixed by industrial conditions and economy in marketing. Thus, if a refinery at Parkersburg, W. Va., could most conveniently and cheaply supply points in southern Ohio, or one on New York Harbor could better supply points in northeastern Pennsylvania, there appear to be no economic reasons why

southern Ohio should not be embraced in the same territory with West Virginia points and northeastern Pennsylvania with New York points. The inclusion of Lewiston, Idaho, in Continental Oil Co. territory rather than in California territory, illustrates the same point; and this case has caused considerable complaint. (See p. 118.) Almost without exception, however, the Standard territories are rigidly coterminous with State boundaries, sometimes regardless of freight rates or other factors which would normally determine the cheapest source of supply.

The only exceptions to the situation just described that have been found are in Arkansas and Oklahoma. In the former State both the Standard Oil Co. of Louisiana and the Magnolia Petroleum Co. have tank-wagon stations, and in Oklahoma both the Standard Oil Co. (Indiana) and the Magnolia company have stations. These few exceptions, however, have little significance. The case of overlapping territories in Arkansas is of some interest as indicating that the several Standard companies might interpenetrate and still do a profitable business.

To some extent the different rules of law obtaining in different States make it advantageous to recognize State lines in organizing a business. This fact, however, does not explain why any State should be in one Standard marketing territory rather than in another; nor does it prevent two or more companies from operating in the same territory.

None of the so-called "independent" companies have marketing territories limited as are the Standard marketing territories. Such big "independents" as The Texas Co., Gulf Refining Co., Indian Refining Co., National Refining Co., Cudahy Refining Co., and Pure Oil Co., all do business in more than one of the Standard marketing territories, and find it possible to make profits while competing with one another and with the several Standard companies. The Texas Co.'s domestic gasoline business is scattered irregularly over 32 States and the District of Columbia and 10 Standard marketing territories. The Gulf Refining Co.'s business is similar, though not scattered over quite so wide an area. The Indian Refining Co. markets gasoline in at least 22 States all through the Middle West and eastern half of the country. According to the Commission's information, the National Refining Co. sells gasoline in 15 States and 5 different Standard territories. It follows that the Standard territories as now limited and bounded are not required for the conduct of a profitable business.

(13) In so far as gasoline is concerned—and it is now the chief refined product of crude oil—little, if any, competition exists among the several Standard companies. Considerable shipments of gasoline are made by the various Standard companies into the territories of other Standard concerns, but such shipments are generally made

to the other Standard companies, for sale by them as their own product, and not in competition with them.

Such intercompany sales, secured from the records of purchases by the principal Standard companies east of the Mississippi River, are shown in the following table:

TABLE II.—INTERCOMPANY PURCHASES OF GASOLINE BY SPECIFIED STANDARD COMPANIES:[1] 1915.

Companies selling gasoline.	Companies purchasing gasoline.						Total intercompany sales of specified companies.
	Atlantic Refining Co.	Standard of Indiana.	Standard of Kentucky.	Standard of New Jersey.	Standard of New York.	Standard of Ohio.	
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*
Atlantic Refining Co.	.....	.....	6,493	2,009,077	[2] 22,950	975,720	[2] 3,014,240
Imperial Oil Co., Ltd.	.....	.....	.....	.....	30,150	.....	30,150
Magnolia Petroleum Co.	.....	.....	3,503,078	6,999,142	[3] 3,510,386	.....	14,012,606
Solar Refining Co.	.....	.....	14,562	4,756,304	.....	10,872,008	15,642,874
Vacuum Oil Co.	.....	.....	.....	.....	13,612,250	.....	13,612,250
Standard Oil Co. (Indiana)	1,570,434	.....	12,543,631	2,752,788	1,254,950	37,817,420	55,939,223
Standard Oil Co. (Kansas)	.....	17,885,287	.....	.....	.....	.....	17,885,287
Standard Oil Co. of Louisiana	.....	.....	19,919,013	8,440,011	.....	.....	28,359,024
Standard Oil Co. (New Jersey)	.....	.....	311,903	.....	[4] 53,729,015	273,854	54,314,772
Standard Oil Co. of New York	100,875	.....	.....	.....	.....	308,514	409,389
Standard Oil Co. of Ohio	321	.....	.....	.....	.....	.....	321
Midwest Refining Co.[5]	.....	2,114,657	.....	.....	.....	.....	2,114,557
Total purchases from specified companies.	1,671,630	19,999,944	36,298,680	24,957,322	72,159,701	50,247,516	205,334,793

[1] The companies specified are the chief Standard companies east of the Mississippi River, with the exception of the Midwest Refining Co.

[2] The Atlantic Refining Co. reported 451,313 gallons sold during 1915 to the Standard of New York.

[3] Includes 1,960,936 gallons crude naphtha.

[4] Includes101,225 gallons crude naphtha.

[5] Midwest Refining Co. was not controlled by Standard interest in 1915, but operated in harmony with the Standard of Indiana. It is located in Wyoming.

(14) In each of the territories occupied by the various Standard companies, however, more or less competition is offered by the so-called independents. Such competition is especially noticeable in a large part of the North Central States, where Oklahoma-Kansas refiners, and jobbers supplied by them, have competed keenly with the Standard of Indiana (see p. 122); and along the Atlantic and Gulf coasts, where The Texas Co. and the Gulf Refining Co. have made inroads on the Standard's business, even as far north as Maine. The Shell Co. of California—controlled by foreign interests—appears to be one of the most important competitors of the Standard Oil Co. (of California) on the Pacific coast, though not in the Rocky Mountain States.

As already stated, the various Standard companies together in 1915 manufactured over 60 per cent of the gasoline products produced by United States refiners reporting to the Commission; and their sales equaled about 65 per cent of sales by refiners reporting to the Commission. Naturally these percentages differed in different States. (See p. 144.) In parts of the Indiana company's territory the "independents" marketed 50 per cent of the gasoline. In New England States, however, the Standard Oil Co. of New York had about 70 per cent of the sales.

INEQUALITIES IN PRICE.

(15) Inequalities existed in the prices of gasoline between the different Standard marketing territories. These inequalities were often as much as 2 cents per gallon and ranged as high as 8 cents in some cases. Some differences should be expected on account of differences in cost; but the inequalities referred to were not based entirely upon differences in costs, nor upon the competitive working of demand and supply. (See pp. 113, 134.) The various diagrams (Nos. 1–4 and 13–19, opposite pages 115 to 118) found in the body of the report will make this clear. No difference in the quality of the gasoline sold in different sections has been found sufficient to explain the differences in price and the changes therein during 1915. (See p. 119f.)

The most noticeable inequality found is that which existed between the price in Indiana territory as compared with surrounding territories after full allowance is made for freight and marketing costs. The following condensed table shows the variations in the average tank-wagon (wholesale) prices of gasoline in certain Standard territories after allowing for freight:

TABLE III.—AVERAGE TANK-WAGON PRICES OF GASOLINE, FREIGHT DEDUCTED, IN SPECIFIED STATES REPRESENTING STANDARD TERRITORIES, JANUARY, JULY, AND DECEMBER, 1915.

1915.	Illinois.	Ohio.	Kentucky.	Massachusetts.	New Jersey.	Pennsylvania.	Colorado.
	Standard of Indiana.	Standard of Ohio.	Standard of Kentucky.	Standard of New York.	Standard of New Jersey.	Atlantic Refining Co.	Continental Oil Co.
January	10.72	10.96	11.88	12.62	8.96	10.43	12.23
July	8.99	9.90	11.22	13.30	11.19	10.11	9.16
December	14.67	16.48	17.15	20.43	18.58	16.69	16.53

The average January prices, freight deducted, ranged from 8.96 cents in New Jersey up to 12.62 cents in Massachusetts, a difference of nearly 4 cents. The range in July was from 8.99 cents in Illinois to 13.30 cents in Massachusetts, a difference of over 4 cents; in December the lowest point in the table was again the Illinois price of 14.67 cents and the highest was in Massachusetts, 20.43 cents, a difference of nearly 6 cents. As the figures compared are monthly averages they

do not show the maximum differences as found in certain periods within the months. It is impossible to explain these differences on any competitive basis.

The significance of the foregoing inequalities is increased by the fact that the Standard of Indiana made large sales of gasoline to most of the neighboring Standard companies. (See p. 8, Table II.) The Kentucky, Nebraska, and Ohio companies depended to a large extent upon the Indiana company for gasoline, while the New York, New Jersey, and Atlantic companies also made large purchases. The Continental Oil Co., too, secured gasoline in large quantities from the Midwest Refining Co. (one of the so-called "independents"), which in turn drew upon the Casper (Wyo.) refinery of the Standard of Indiana for its semifinished material.

(16) The prices of gasoline sold by those "independent" companies which operated in more than one of the Standard marketing territories also showed inequalities. (See p. 118.) Such independents maintain that they generally follow the prices made by the several Standard companies in their respective territories. This is generally true (see pp. 155–157), though "independent" concerns have cut prices at points for the purpose of gaining a foothold in the trade.

(17) In considering the course of gasoline prices in the territory occupied by the Standard of Indiana, the Commission finds that while the "independent" jobbers in this territory have engaged in a competitive struggle that has sometimes involved price cutting, yet it appears that the Standard of Indiana is responsible for the very low prices maintained in its territory from June 10 to September 15, 1915. This company was aided in maintaining low prices by the receipt of profits on sales made to other Standard companies operating in territories where prices were higher.

Very briefly stated, the principal facts are these: (1) The Standard of Indiana, which was responsible for the last general price reductions in June, 1915 (see pp. 123, 130), kept prices at a low level till about the middle of September, over a month after crude-oil prices had begun to go up and after they had advanced substantially. (2) The lowest general tank-wagon price level was 8.5 cents per gallon (in 100-gallon lots), a price which, allowing for freight and marketing expenses, was less than the average September f. o. b. refinery price of the "independent" refiners, and left very little margin, if any, to many jobbers. At some points the tank-wagon price was as low as 7.5 cents. Indeed, as shown by Tables 27 and 31, pages 92 and 98, these prices were so low that at the Sugar Creek refinery of the Standard of Indiana (the receipts of which were little affected by profitable sales outside Indiana territory), if the gasoline produced during September, 1915, had been sold at the prices then prevailing, the business would have resulted in a loss. (3) Before the Indiana company raised its tank-wagon price gasoline prices were advanced in other territories by the various Standard com-

panies; and the Indiana company, by making sales to the other companies (see p. 8, Table II), was able to recoup itself to some extent for the decline in profits which resulted from the low price in its own territory. (4) After November this company advanced its prices very rapidly, and as the low prices of July and August were remunerative, the high prices of December meant a very large margin. It seems, moreover, that if the efficiency and cheapness of production of the Indiana company are to be taken to justify the low price made by it, the questions, (1) why its relatively low prices were not continued and (2) why they were limited to its own arbitrarily fixed territory, are forcefully raised. The latter is emphasized by its large outside sales.

COSTS AND MARGINS.

(18) An analysis of costs and f. o. b. refinery prices of gasoline and other petroleum products shows that both the f. o. b. refinery price of gasoline and also the refinery returns from the whole group of refined products in 1915 rose to a greater extent than the cost of production. The margin of profit increased with the great majority of refiners between July and December, 1915. This conclusion, based upon costs and f. o. b. refinery prices, is substantiated by increased net earnings during the latter part of 1915.

These statements of fact apply both to Standard companies and to other large refiners.

Summed up, the facts are as follows: The chief element in increased cost of refined products is the increased cost of crude petroleum, as it constituted approximately 80 per cent of the cost of gasoline at most of the important refineries in 1915. There were during 1915 increases in the cost of certain materials, such as sulphuric acid and caustic soda, but these were generally only a little over 1 per cent of the total cost.

For a group of four large eastern refineries, which used mixed crude oils, chiefly from the Oklahoma and Appalachian fields, the average reported book cost of the crude oil used advanced between July and December, 1915, from 3.90 cents to 4.93 cents, *an increase of 1.03 cents per gallon;* the average value of all the products from a gallon of crude, allowing for loss, advanced from 6.40 cents to 8.28 cents, *an increase of 1.88 cents;* the average advance in the price of the quantity of gasoline obtained from a gallon of crude was 1.33 cents. This 1.33 cents is the amount of the increase in f. o. b. refinery price of the quantity of gasoline obtained from a gallon of crude oil, and is equal to over 6 cents per gallon of gasoline; it is included in the combined products, the total advance of which was 1.88 cents.

For four large Standard refiners and three medium-sized other companies using practically nothing but Mid-Continent crude oil and all producing lubricating oils, the average reported book cost

of crude oil used advanced between July and December, 1915, from 1.86 cents to 3.14 cents, *an increase of 1.28 cents* per gallon; the average value of all the products from a gallon of crude, allowing for loss, advanced from 4.43 cents per gallon to 6.36 cents, *an increase of 1.93 cents;* the average advance in the price of the quantity of gasoline obtained from a gallon of crude was 1.14 cents, or over 5 cents per gallon of gasoline.

The average reported book cost for a group of four refineries using Cushing crude were 1.13 cents in July and 3.31 cents in December, 1915, *an increase of 2.18 cents;* the average f. o. b. refinery price of all the products from a gallon of crude, allowing for loss, *advanced 2.54 cents* during the same period; the average advance in price of the gasoline obtained from a gallon of crude oil was 1.86 cents, or over 6 cents per gallon of gasoline.

TABLE IV.—AVERAGE ADVANCES IN COST OF CRUDE AND PRICE OF PRODUCTS, JULY TO DECEMBER, 1915 (CENTS PER GALLON).

Item.	Refiners using Oklahoma and Appalachian mixed crude oils.	Refiners using Mid-Continent crude oil.	Refiners using Cushing crude oil.
Average advance in book cost of crude oil	1.03	1.28	2.18
Average advance in refinery price of all products	1.88	1.93	2.54
Average advance in refinery price of the quantity of gasoline obtained from a gallon of crude	1.33	1.14	1.86

All the refineries included show increased margins between the cost of a gallon of crude oil and the refinery price of the products from a gallon of crude oil, the increases being 0.85 cent for the refineries using Oklahoma and Appalachian mixed crudes; 0.65 cent for Mid-Continent, and 0.36 cent for Cushing. As there are 42 gallons in a barrel of crude oil, these increased margins between crude oil and the products obtained therefrom mean increases of about 35 cents, 27 cents, and 15 cents, respectively, per barrel.

As these representative refiners [1] were not losing in July, it is apparent that in December they were making from 15 to 35 cents more profit on each barrel of crude oil refined. A refinery, therefore, which used 1,000,000 barrels of crude in December [2] might have made an increased profit of, say, $250,000 for the month.

The foregoing figures show that the price of gasoline during the latter part of 1915 advanced to a greater extent than the cost of crude oil used. The cost of crude oil, however, is not the total cost of refining. It remains to ascertain whether the price was sufficient to cover all costs in the middle of 1915, and whether the margins above cost increased thereafter. An examination has been

[1] Several small "independent" concerns show losses for 1915 (see p. 108).

[2] The Standard of Indiana, Standard of New Jersey, and The Texas Co. consumed more than this on the average in 1915.

made of the books of a group of refineries chosen for their representative character, and the cost and the margin per gallon of gasoline have been computed. These are shown in the following table. The method used is that of treating products other than gasoline as by-products, and accordingly the total cost of refining the crude has first been charged to gasoline. Then this cost has been reduced by the amount of the current value of the by-products currently produced. The result is the maximum amount of all the expenses of refining that can be charged to gasoline currently produced. The figures shown are averages for the two six-month periods of 1915, and for each month of the second period.

TABLE V.—COSTS (ALLOWING FOR GAINS AND LOSSES ON OTHER PRODUCTS), PRICES, AND MARGINS PER GALLON OF GASOLINE PRODUCED AT REPRESENTATIVE REFINERIES, BY SIX-MONTH PERIODS, 1915, AND BY MONTHS JULY-DECEMBER, 1915.

[All figures in cents per gallon.]

Company and item.	By 6-month periods.			By months.						
	Jan.-June.	July-Dec.	Increase.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Increase July-Dec.
Standard of New York, Buffalo plant:										
Cost	6.15	6.54	0.39	5.55	5.19	6.33	6.71	7.41	7.27	1.72
F. o. b. refinery price.	7.21	10.25	3.04	8.03	8.98	10.59	11.29	12.20	13.72	5.69
Margin	1.06	3.71	2.65	2.48	3.79	4.26	4.58	4.79	6.45	3.97
Atlantic Refining Co., Philadelphia plant:										
Cost[1]	1.19	3.82	2.63	1.60	3.65	2.72	4.22	6.57	5.92	4.32
F. o. b. refinery price.	8.97	10.29	1.32	8.18	9.00	9.63	11.21	11.88	13.50	5.32
Margin[1]	7.78	6.47	−1.31	6.58	5.35	6.91	6.99	5.31	7.58	1.00
Company A:										
Cost	8.23	8.65	.42	7.01	6.15	7.05	11.43	9.69	9.33	2.32
F. o. b. refinery price.	8.54	11.43	2.89	8.85	9.60	10.77	11.65	13.00	15.46	6.61
Margin	.31	2.78	2.47	1.84	3.45	3.72	.22	3.31	6.13	4.29
Standard of Indiana:										
Whiting plant—										
Cost	3.11	4.07	.96	2.39	3.09	4.45	4.58	4.64	5.25	2.86
F. o. b. refinery price	7.24	8.27	1.03	6.72	6.89	7.41	8.57	10.04	11.84	5.12
Margin	4.13	4.20	.07	4.33	3.80	2.96	3.99	5.40	6.59	2.26
Sugar Creek plant—										
Cost	4.97	5.99	1.02	4.39	5.58	6.82	7.22	6.25	5.94	1.55
F. o. b. refinery price	6.10	7.10	1.00	5.79	5.82	6.39	7.28	9.08	10.95	5.16
Margin	1.13	1.11	−.02	1.40	.24	−.43	.06	2.83	5.01	3.61
Company B:										
Cost	5.05	5.23	.18	3.14	3.16	6.13	5.13	5.54	7.10	3.96
F. o. b. refinery price.	5.95	8.13	2.18	5.82	5.91	6.72	8.42	9.47	10.73	4.91
Margin	.90	2.90	2.00	2.68	2.75	.59	3.29	3.93	3.63	.95

[1] The Atlantic Refining Co's. cost of gasoline is made unduly low, and its margin unduly high, by the method used in this table. This is true for the reason that the company's lubricating oil is a main product showing a margin of gain, which gain has been deducted from cost of gasoline. (See pp. 87-88.)

The six months' figures show that, even including all losses on products other than gasoline in the cost of gasoline, and deducting gains, the average margin per gallon of gasoline produced was greater in the second six-month period than in the first, at four of the six refineries. There were two cases in which the average margin was not greater in the second half of the year: (1) The Atlantic Refining Co. had unusually large margins throughout the entire year, which is due to the fact that it did not make losses but gains on products other than gasoline. Consequently, as these gains on other products were less in the second half of the year, the margin per gallon of gasoline was reduced. The by-products method of determining costs is not conclusive in such cases. (2) The exception in the case of the Standard of Indiana's Sugar Creek plant is chiefly explained by the unusually low price of gasoline in Indiana territory during the third quarter of 1915.

For studying the advance in prices in 1915, the figures by months mean much more than the six-month averages. Taking the July margin as the basis—though it was not the lowest in most cases—and comparing it with the December margin, it is shown that in every case there was an increased margin per gallon of gasoline produced of approximately 1 cent or more per gallon of gasoline. In four of the six cases the increase in margin was over 2.25 cents per gallon. In one case (Company A) the monthly cost figures vary so widely that the monthly margins do not seem normal, and in this case the six-month comparison is the safer.

The preceding method of computing costs is very liberal to the refiners and is at most to be regarded as determining but a maximum cost. (See p. 73.) Moreover, in several cases the July costs were not the lowest costs. It may, therefore, safely be concluded that the increase in price of gasoline is not to be wholly explained by increase in cost, as costs did not increase as rapidly as prices.

EARNINGS AND STOCK QUOTATIONS.

(19) The facts concerning costs and margins are borne out by the large net earnings and the high quotations of the stocks of the chief companies, both Standard and others. There follows a table showing for 1915 the percentage of net earnings on investment for 24 representative refining and marketing companies.

TABLE VI.—PER CENT OF NET EARNINGS ON TOTAL NET INVESTMENT FOR TWENTY-FOUR REPRESENTATIVE REFINING AND MARKETING COMPANIES, 1915.

Name of company.	Character of operations.*	Per cent of net earnings on investment. 1915.
Atlantic Refining Co	Refining and marketing	21.7
Standard Oil Co. (Indiana)	do	36.0
Standard Oil Co. (New Jersey)	Producing,[1] refining, and marketing	20.6
Standard Oil Co. of New York	Refining and marketing	16.0
Standard Oil Co. of Ohio	do	23.9
Standard Oil Co. (Kansas)	Refining	17.9
Magnolia Petroleum Co	Producing, refining, and marketing	14.2
Continental Oil Co	Marketing	34.0
Standard Oil Co. (Nebraska)	do	37.5
Standard Oil Co. (Kentucky)	do	22.8
Standard Oil Co. (California)	Producing, refining, and marketing	10.6
Company 1[2]	Refining	3.3
Company 2[2]	do	6.1
Company 3[2]	do	5.6
Company 4[3]	do	[4] 12.3
Company 5	Producing, refining, and marketing	[5] 8.4
Company 6[6]	Refining and marketing	73.3
Company 7	Producing and refining	[7] 50.7
Company 8	do	76.0
Company 9	Producing [1] and refining	18.8
Company 10	Producing, refining, and marketing	13.2
Company 11	Producing and refining	23.5
Gulf Refining Co	Producing,[1] refining, and marketing	[8] 11.9
The Texas Co.[9]	do.[1]	12.7
Average		18.6

* Several "independent" companies own pipe lines either directly or through subsidiaries, and an important part of the stockholders of the Standard companies are stockholders in pipe-line companies. Most of the independent companies also own tank cars.

[1] Allied with subsidiary producing company.

[2] Small concerns with unsatisfactory books of account.

[3] Year ended Oct. 31, 1915.

[4] Investment includes $197,327 additions to surplus on account of reappraisal.

[5] A dividend of $2,539,737 was paid on common stock in February, 1916.

[6] Year ended May 1, 1916.

[7] Based on earnings for 13 months.

[8] "Investment" includes over $8,000,000 loan from Gulf Pipe Line Co. and Gulf Oil Corporation, on which no interest was paid.

[9] Year ended June 30, 1915.

The foregoing table shows that during 1915, at a time of increased cost of crude oil and materials, very large net earnings were made by all the large refiners, running in all but four cases well over 10 per cent on the investment. The four exceptions were relatively small, weak concerns. Eleven of the companies made over 20 per cent. These earnings were in some cases made by purely refining companies in spite of the advances in crude, and in other cases by mixed refining and producing companies partly *because* of the advance in crude.

(20) In conclusion, attention should be called to the general upward trend of the stock quotations of the companies concerned: The quotations of the stocks of all the companies, both Standard and others, advanced sharply during the second half of 1915.

RÉSUMÉ.

To recapitulate, the investigation of the petroleum industry by the Commission shows that a decreasing supply of light crudes, coupled with increasing foreign and domestic demands, explains a part of the advance in gasoline prices during 1915, but that part of the advance in certain sections, at least, was unnecessary and to a certain extent due to artificial conditions already pointed out. First, during 1915 unusually large stocks of crude, bought at low prices, were accumulated, thus withholding great quantities from the market (see pp. 46, 48) and tending to advance prices of crude oil. Second, not only was the advance in gasoline prices greater than was required by the advance in cost, but also the prices were advanced with inequalities as between and coinciding with the territories occupied by the various Standard companies.

In the judgment of the Commission, the absence of substantial competition among the various Standard companies, coupled with the large proportion of the business they hold, was an appreciable factor in causing this situation.

REMEDIES.

The Commission has carefully considered the possibility of relief from the situation indicated in this report. As already stated, a part of the advance in gasoline prices during the latter part of 1915 was a result of the operation of increasing demand for gasoline and decreased production of light crude oil. For this natural advance in price certain obvious remedies lie in the direction of economy in production and use of petroleum and its products. Numerous wastes can be avoided; improved methods can be used in refining which will give greater yields of gasoline products; motors and carburetors can be adapted to use cheaper fuels, etc. Though the supply of crude oil is to be regarded as a limited natural resource which one day will be exhausted and which, therefore, must ultimately decrease in quantity, some relief can be hoped for by not wasting that resource.

In connection with the advance in gasoline prices in 1915, attention has already been called to the imperfections in the competition existing in the industry, which imperfections are due to several causes.

First is the fact that a single group of refiners have to a large extent a community of interest based on common stock holding. They produce and sell so large a proportion of the product, gasoline, that they can and do make the generally prevailing market price, and are generally followed by the others. Moreover, this same community of interest

embraces oil-producing and transporting companies (pipe lines) to such an extent that it has had an advantage over smaller competitors in that the pipe lines have not been made available to its competitors on the basis of reasonable rates and conditions of service.[1] This advantage as to pipe lines holds true of a few large independent concerns. Under such circumstances, competition can hardly be expected to work effectively and fairly, or to adjust prices to costs with any reasonable precision.

Second, the absence of accurate statistics of production, stocks, and sales of crude oil and the chief refined products make the working of competition imperfect. The only statistics of crude oil currently available are the uncertain and sometimes conflicting figures printed in trade journals; while statistics of the production of gasoline and other refined products are practically nonexistent for current purposes. Even the export statistics are unsatisfactory. The crude-oil industry is a peculiarly speculative one at best, and its vicissitudes affect the refining business. With such imperfect knowledge of conditions the refiners with small resources are especially handicapped. If there is to be a reasonable adjustment between demand and supply, there must be knowledge of demand and supply conditions.

The remedies for artificial or unnecessary elements in the advance of gasoline prices suggested by the foregoing statement of causes are:

1. To prevent the control of the market from being exercised through common ownership, five courses of possible action are suggested—

(*a*) Possible action by the Department of Justice in view of the facts disclosed by the Commission's investigation.

(*b*) An act of Congress providing, when conditions require, for the reopening of antitrust cases, on the application of the Attorney General, by a bill of review (see p. 163).

(*c*) Abolition, by legislation, in certain cases, of common stock ownership in corporations which have been members of a combination dissolved under the Sherman law.

(*d*) Effective limitation upon common ownership of stock in potentially competitive corporations by withdrawing the power of voting and control.

(*e*) Legislation which, while recognizing common ownership, would fix upon such common owners the responsibility for the acts of each of the several companies so owned, which are preventing competition.

2. In the opinion of this Commission, it would in the long run be the simplest and most effective policy to segregate the ownership of the pipe lines from the other branches of the petroleum industry. This

[1] Report of the Federal Trade Commission on Pipe-Line Transportation of Petroleum, p. 4.

would mean that no controlling portion of the stock of any pipe-line company engaged in interstate commerce should be owned by individuals, companies, or corporations that are also interested as owners in any oil-producing or refining properties, and vice versa.

3. In view of the bearing of accurate statistics upon industry and competitive conditions, it is suggested that the appropriate branch of the Federal Government should be provided with adequate means for carrying on the statistical work required.

4. It is suggested, in view of the variation in the product now sold as gasoline, that only such petroleum products as contain a certain proportion of reasonably volatile elements shall be sold in interstate commerce as "gasoline."

WILLIAM J. HARRIS, *Chairman.*
JOSEPH E. DAVIES.
WILLIAM B. COLVER.
JOHN F. FORT.

(Commissioner Will H. Parry being ill when the final draft of the report was passed upon by the Commission it could not be submitted to him.)

CHAPTER I.

INTRODUCTION.

Section 1. The advance in gasoline prices.

The advance which took place in the price of gasoline in 1915 was not a single uniform movement. It was a series of unequal advances. It began at different times in different sections, and varied in amount. In general the price declined somewhat between January and July, and this decline was followed by a rather sharp advance during the remainder of the year. This statement, however, overlooks many local differences. The facts may be gathered from the following statements and tables concerning the advance in wholesale and retail prices.

In order to facilitate comparisons and to simplify presentation, the price figures have all been reduced to monthly averages. This tends to eliminate extremes; thus, if during one month the price during the first 10 days was 9 cents, during the second 10 days 10 cents, and during the third 10 days 11 cents, the average price for that month would be 10 cents, but during a third of the time the price was really 11 cents.

WHOLESALE PRICES.—The price of gasoline as sold on tank-wagon delivery to garagemen and other dealers, the "tank-wagon price," may be taken as representative of the wholesale market. Speaking generally, the tank-wagon price of a gallon of gasoline advanced between July and December, 1915, by from 7 to 9 cents, a rise of from 75 to 85 per cent. (See Statistical Exhibits, Tables 1–15.) In some sections the advance was greater; in others less; but the preceding statement is fairly representative of the situation during the second half of 1915, except in the far West, where there was less variation in prices. Fuller details will be found in the diagrams and tables presented on pages 115 to 119.

This rise was preceded by a fall between January and July of about 1 cent a gallon, except on part of the Atlantic seaboard, where, partly on account of competitive conditions, the January price was the lowest.

The table following concisely indicates the general trend of prices during 1915, though, being based on the monthly average prices, it does not show the maximum variations.

TABLE 1.—MONTHLY AVERAGE TANK-WAGON PRICES OF GASOLINE IN SPECIFIED STATES, 1915.

Month.	Massachusetts.	New Jersey.	Pennsylvania.	Ohio.	Indiana.[1]	Kentucky.	Texas.	Colorado.	California.
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
January	13.32	9.30	11.17	11.61	11.03	13.48	8.28	15.92	11.25
February	13.00	9.23	11.12	11.00	10.89	13.44	8.10	15.82	10.31
March	13.00	9.23	11.08	10.97	10.50	13.33	8.10	15.65	10.25
April	13.00	9.20	11.05	10.95	10.50	13.23	9.03	15.11	10.25
May	13.00	9.61	10.91	10.95	10.50	13.03	10.10	13.89	10.25
June	13.80	10.65	10.91	10.57	9.70	12.95	10.79	13.50	10.25
July	14.00	11.55	10.90	10.55	9.50	12.83	11.09	12.84	9.85
August	14.58	12.26	11.40	10.30	9.50	12.90	11.68	12.90	9.75
September	16.80	14.40	13.27	11.44	10.10	13.70	12.93	14.34	10.02
October	17.77	15.68	14.08	12.94	11.73	14.91	14.84	15.81	11.81
November	19.23	17.23	15.51	14.87	13.33	16.25	16.37	17.73	12.88
December	21.13	18.94	17.50	17.13	15.18	18.76	17.10	21.21	13.75
Advance, July–December.	7.13	7.39	6.60	6.58	5.68	5.93	6.01	8.37	3.90

[1] In Indiana from January to November there was a discount of 1 cent per gallon on sales in quantities of 100 gallons and over, which is not allowed for in this table.

RETAIL PRICES.—The public, and especially the consumers, are most interested in the retail price. The Commission has collected the prices made by retail dealers during 1915, chiefly at garages, in all sections of the country and finds that they ranged from 0 to 5 cents above the tank-wagon price. In general retail prices kept pace with the tank-wagon market. The movement of the average retail price of gasoline in groups of representative towns in certain States is shown in the following table:

TABLE 2.—MONTHLY AVERAGE RETAIL PRICES OF GASOLINE, CHIEFLY AT GARAGES, IN SPECIFIED STATES, 1915.

Month.	Massachusetts.	New Jersey.	Pennsylvania.	Ohio.	Indiana.	Kentucky.	Texas.	Colorado.	California.
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
January	15.93	12.25	14.27	13.91	12.46	14.39	12.00	17.17	12.33
February	15.43	12.17	13.81	13.33	12.34	14.39	10.89	17.17	11.69
March	15.29	12.17	13.46	13.00	11.91	14.18	11.00	17.17	11.53
April	15.24	12.17	13.39	12.77	11.90	14.07	11.37	17.16	11.50
May	15.07	12.43	13.38	12.77	11.90	13.77	12.00	15.76	11.50
June	15.56	13.51	13.36	12.30	11.38	13.63	12.30	15.50	11.50
July	15.66	14.23	13.20	11.85	10.98	13.50	12.95	15.17	11.13
August	16.43	14.94	13.40	11.91	10.88	13.65	13.37	14.86	11.04
September	18.23	16.89	15.18	13.04	11.31	14.27	14.42	15.75	11.13
October	19.64	18.30	16.09	14.53	12.93	15.91	16.45	16.80	12.63
November	20.77	19.79	17.34	16.44	14.73	17.51	17.47	19.64	14.09
December	23.14	21.30	18.89	18.61	16.67	19.90	19.00	22.05	14.95
Advance, July–December	7.48	7.07	5.69	6.76	5.69	6.40	6.05	6.88	3.82

The monthly average prices for all States and for the marketing "territories" of the several Standard companies will be found in the Statistical Exhibits appended to this report, pages 197 to 200.

The foregoing tables are based on the prices received by Standard marketing concerns and garages supplied by them. As such prices were the prevailing ones throughout the country they are representative.

Section 2. Complexity of the causes of the advance in gasoline prices.

The advance in the price of gasoline after July, 1915, can not be fully explained by any single or simple cause. During 1915 many conditions affecting the price of gasoline changed and new conditions arose to complicate the situation. The use of gasoline-consuming engines increased; exports of gasoline were greater; while the demand for such products as kerosene and fuel oil remained nearly stationary, making it necessary for gasoline to bear a larger proportion of cost (p. 52). On the other hand, the production of petroleum, or crude oil, which is the great source of gasoline products,[1] not only failed to increase, but in the case of the lighter crudes—those having the highest gasoline content—it declined. Also, the cost of the supplies used in the refining and treating of petroleum products increased slightly.

The factors tending to increase the price were partly offset by improvements in the methods of refining, which, by extracting a larger proportion of gasoline from the crude oil, tended to reduce the cost of gasoline per gallon and at the same time, according to very general belief, somewhat lowered the quality of the gasoline itself for use in existing motors. Originally gasoline meant a "straight run" product, or one secured by refining crude oil in ordinary stills without high temperature or pressure. In the process of refining, practically all volatile oils rising from the still when a temperature of 150° was maintained were called "gasoline," and this gasoline had an average gravity on the Baumé[2] scale of about 64° or over. When certain pressures and temperatures are maintained in the stills heavy crudes and residual by-products can be broken up ("cracked") into lighter ones, thus yielding larger quantities of volatile products. This constitutes a chemical change, the molecules being so "cracked" as to make a different and more volatile substance. While the practice of cracking oil has long been used, it was during 1915 that the use of "pressure stills," in which heavy, residual products of straight-run

[1] The term "gasoline products" is used in this report to cover those products of crude oil, which are more volatile than kerosene. They cover such products commonly known as gasoline, naphtha, and benzine. Refiners and distributors have no common standard which accurately describes each of these products.

[2] The Baumé test is a test of specific gravity used in the oil industry. The Baumé test, however, differs from specific gravity, the lower figures on the Baumé scale indicating heavier oils and the higher figures the lighter oils.

distillation were re-run, became an important factor in gasoline pro duction, with the result that "cracked" gasoline was put on th market in large quantities. This "cracked" gasoline generally has lower Baumé test—i. e., is heavier or less volatile—than the ordinar "straight-run" product. Again, even in the ordinary process of disti lation, the "cuts," or points at which the products rising from the still are switched from one receiving tank to another, came to be made a higher temperatures, ranging around 175° instead of 150°, as pre viously, with the result that a larger proportion of the crude passe out of the still in the gasoline "fraction" and the resulting product, lik the "cracked" product, was heavier, or was less volatile. Indeed, a the price of "gasoline" rose and that of illuminating oils remaine almost stationary, it became not uncommon to blend low-grade napl tha and even kerosene with straight-run gasoline, bringing the averag gravity of the mixture to the prevailing commercial level by addin enough "casing-head" gasoline. This latter product is very volatil having a Baumé test of about 84° or over, and is obtained from natur gas by compression or absorption.

Another complicating circumstance lay in the character of the busi ness organization obtaining in the petroleum industry. Merely t touch upon those aspects of the situation that may have direct affected gasoline prices, it is to be observed that in some sections the country the former subsidiaries of the Standard Oil Co. (Ne Jersey) were decidedly dominant, while in others their position w not so strong; and that almost without exception these Standar companies limited the fields of their chief operations by State lines much the same as before the dissolution—and did not invade o another's territories in the marketing of gasoline.

This territorial division is so important and will be referred to frequently that it should be described at once. The map facing th page shows a complete division of the country into 11 distinct ma keting territories. The 11 companies which do the tank-wag marketing of gasoline (and kerosene) for Standard refiners in the territories are as follows:

(1) Standard Oil Co. of New York (in Maine, New Hampshi Vermont, Massachusetts, Rhode Island, Connecticut, and Ne York).

(2) Atlantic Refining Co. (in Pennsylvania and Delaware).

(3) Standard Oil Co. (New Jersey) (in New Jersey, Maryland, Vi ginia, West Virginia, North and South Carolina, and the District Columbia).

(4) Standard Oil Co. of Ohio (in Ohio).

(5) Standard Oil Co. (Indiana) (in Michigan, Indiana, Illino Wisconsin, Minnesota, North and South Dakota, Iowa, Missou Kansas, and the northern part of Oklahoma).

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(6) Standard Oil Co. (Nebraska) (in Nebraska).

(7) Standard Oil Co. (Kentucky) (in Kentucky, Mississippi, Alabama, Georgia, and Florida).

(8) Standard Oil Co. of Louisiana (in Louisiana, Arkansas, and Tennessee).

(9) Magnolia Petroleum Co.[1] (in Texas, Oklahoma, and Arkansas).

(10) Continental Oil Co. (in Montana, Idaho, Wyoming, Colorado, Utah, and New Mexico)..

(11) Standard Oil Co. (California) (in Washington, Oregon, California, Arizona, and Nevada).

Hereafter these companies will be referred to as "Standard of New York," "Standard of California, etc., and their territories will be designated as "New York territory," "California territory," etc.

In only two cases do these territories overlap, namely, in Oklahoma and in Arkansas. In the former case the Standard of Indiana supplies a few points in northern Oklahoma, a State in which the Magnolia Petroleum Co. is the chief Standard marketing company; while in Arkansas the Magnolia Petroleum Co. and the Standard of Louisiana both do business. In 1915, however, these two companies both sold gasoline at only 6 out of 25 towns having a population of 2,500 or over, according to the census.[2]

The significance of these territories will be further discussed (p. 148f), but it should be stated here that these territories are sub-

[1] The Magnolia Petroleum Co. is commonly known as a Standard company, but it should be noted that it is not controlled in the same way as are other Standard companies. About 70 per cent of its stock was owned by J. D. Archbold and H. C. Folger, jr., in 1915, but, as the result of an agreement with the attorney general of Texas, the stock is placed in the hands of a trustee residing in Texas and appointed by the State. The trust agreement provides—

"That during the continuance of this agreement the certificate of shares in the said Magnolia Co. held in trust shall not be voted by anyone in the management of the affairs of the Magnolia Co., except that the trustee shall have the right, in his discretion, upon the written request of the owners thereof, to vote the same, subject to this exception: The five trustees [equivalent to directors] of the Magnolia Co. shall be elected by a majority vote of the remaining shares of stock of the Magnolia Co."

On matters of general business policy Messrs. Archbold and Folger have been consulted. Before voting the stock the trustee is to ascertain how Messrs. Archbold and Folger would like their stock to be voted, and if his judgment concurs with theirs he is to vote it accordingly. Thus they have been consulted on questions concerning the financing of a new refinery. Such consultations are specially common in matters of finance, and, as it is not likely that those who supply the funds will be antagonized, it may be assumed that the wishes of Messrs. Archbold and Folger have weight. The trustee has no share in profits, but receives a salary for his services. While the directors and officers of the Magnolia Petroleum Co. do not hold stock in other Standard companies, Mr. Archbold, in 1915, owned 5,995 whole shares of stock in the Standard of New Jersey out of a total of 983,383 shares, and is president of that company. Mr. Folger owned 1,574 shares in the New Jersey company, and 2,085 shares in the Standard of New York out of a total of 748,666 shares, and was president of the Standard of New York. The Standard of Louisiana is owned by the Standard of New Jersey. The Magnolia Co. regularly sold large quantities of gasoline and other products to the New York and New Jersey companies. (See Table 34, p. 133.) The following facts bear upon the amount of competition in 1915:

(1) The Magnolia and the Standard of Louisiana companies did not overlap except in Arkansas, while they might have competed in Louisiana and Texas as do the Gulf and Texas companies; (2) while they both did business in Arkansas, in 1915 they occupied but 6 towns in common out of 25 towns having a population of 2,500 or over, and but 12 towns all together.

The Magnolia Co. leases the Burton process from the Standard of Indiana and thereby binds itself not to sell the products resulting from this process in Indiana territory (except Kansas).

[2] Representatives of the Magnolia Petroleum Co. have stated to the Commission that the number of such common points has been increased in 1916.

stantially those established by the Standard Oil combination before the dissolution of 1911. When the combination was dissolved in that year the subsidiary companies were left in these territories.

The various Standard refining companies as a rule market their gasoline by tank-wagon delivery, filling stations, or otherwise; and, in the main, they get their supplies of crude oil through allied pipe lines,[1] partly from their own or allied production.

The competitors of the several Standard companies differ widely among themselves in power and their marketing activities are unequally distributed throughout the country. In the Middle Western States, near the oil fields of Kansas and Oklahoma, there have grown up a large number of relatively small refineries which depend upon local supplies of crude oil, and to a great extent upon separate jobbers for the marketing of their products. Their refineries were located near the oil fields, because lack of capital prevented ownership of pipe lines for transporting their supplies of crude oil to points nearer the marketing centers, and the same lack is in part responsible for the fact that most of them do not carry the crude through all the refining processes, but merely "skim" off the lighter and more valuable elements—gasoline and kerosene—and sell the balance as fuel. In this way they and the jobbers dependent upon them have been able to compete with the Standard companies in the Middle West, and they have built up a considerable trade—"gallonage," as it is called in the business.

In Illinois, Ohio, and, above all, in the Pennsylvania region, on the other hand, there exist a considerable number of small refineries, practically all of which carry the refining process to the extent of producing various grades of lubricating oils. These refineries have the advantage of being near the great markets for lubricants and of operating on a crude that is rich in lubricating properties. Although the volume of production is relatively small, the profitable market for lubricants has enabled these smaller plants to exist along with the larger ones. The fact that the manufacture of lubricating oils is one in which experiments and secret processes play a part—that it is not so standardized as is the case with gasoline and kerosene—partly explains the situation. These small refiners are to a considerable extent dependent upon a limited supply of crude oil furnished them by Standard producers and pipe lines.[2]

[1] Prairie Pipe Line Co., Illinois Pipe Line Co., Buckeye Pipe Line Co., National Transit Co., and others. They are related in that their stock is owned in majority by the same individuals.

[2] Some of these small refiners have their own crude production and pipe lines, but for the most part they are dependent upon a limited supply of crude oil which is furnished by the South Penn Oil Co. This company is a former Standard subsidiary, and, besides having about 10,000 wells of its own in the Appalachian field, it also purchases from producers all the oil run direct from the wells by other former Standard subsidiaries, such as the New York Transit Co., National Transit Co., South West Pennsylvania Pipe Lines, and the Eureka Pipe Line.

Finally, there are the two big Gulf coast "independents," The Texas Co. and the Gulf Refining Co., the latter being controlled by the Gulf Oil Corporation. Both of these companies either own or are allied with companies having producing wells, pipe lines, and all the complicated marketing machinery required, and their operations are scattered not only over a large part of the United States, but embrace a growing export trade. In some regions they have competed in price with the Standard and other companies, but for the most part their prices for gasoline follow the Standard companies' prices. (See p. 155f.) As they sell gasoline in several different Standard marketing territories, their prices vary considerably between those territories, and their ability to profit by the relatively high prices maintained in some of these territories enables them to compete at low prices in others. (See p. 156.) This is also true of two or three other "independents," such as the Indian Refining Co. and the National Refining Co.

Thus, the competitive situation is complex, and competition is unequal in degree in different sections. The varying extent to which the different technical stages of the industry are combined makes it difficult to compare costs and profits.

CHAPTER II.

DEMAND AND SUPPLY.

The producers of gasoline have been given the fullest opportunity to present to the Commission the facts concerning the gasoline situation. In briefs, replies to schedules, and in oral statements at hearings they have presented explanations of the increase in gasoline prices, and they have based their explanations upon the following grounds: (1) Increased demand, (2) decreased supply, and (3) increased cost of production. In this chapter the facts of the demand and supply conditions are stated, and in Chapter III costs are analyzed.

As to demand, it is shown that between 1914 and 1915—

(1) Sales of gasoline motors, as indicated by horse-power, greatly increased. According to the only available figures, the increase in the number of automobiles in use was about 38 per cent.

(2) Total sales of gasoline products by refiners increased over 38 per cent.

(3) Exports increased between 35 and 50 per cent; but as the per cent of exports to production increased but little, the significance of the figures is not so great as at first seems.

As to the movement of supply between 1915 and 1914 the salient facts are:

(1) Production of crude oil increased from 301,527,000 barrels in 1914 to 305,952,000 barrels in 1915. The large output of rich Cushing crude in the first half of 1915 made the total gasoline content of the crude oil for the year much larger than that of 1914.

(2) Stocks of crude oil held in storage by pipe lines, producers, and refiners reporting to the Commission increased largely during the year 1915, rising from 204,800,000 barrels in January to 239,500,000 barrels in December.

(3) The use of improved refining methods and processes increased the yield of gasoline per gallon of crude oil.

(4) The production of gasoline and naphtha increased about 31 per cent.

This summary statement does not touch upon all the facts, nor upon the variations in demand and supply which occurred within the single year, 1915. Such facts will be stated in the following pages.

I. DEMAND FOR GASOLINE.

It is extremely difficult to measure the force of demand as affecting gasoline prices. There is no way of measuring people's wants before a price is fixed, and after the price is fixed the demand depends in part upon the price. More than this, there are no statistics available to show just how much gasoline has been purchased at the varying prices that have prevailed, so that it is necessary to resort to estimates based upon the use of instruments which occasion the consumption of gasoline.

Section 1. General character of demand for gasoline.

In a study of this kind it is important to consider the general characteristics of the demand for the particular product concerned. Gasoline products have a pretty rigidly fixed minimum demand in the field of their chief use—as motor fuel—so that the price may rise to considerable heights without any proportionate reduction in consumption. This is true because gasoline has become a necessity to thousands of motor-car owners, to say nothing of the users of trucks, tractors, stationary and portable engines, motor boats, and other internal-combustion engines. In this connection, habits established and investments made during periods of low prices play an important part. Moreover, there has been no commercially available substitute for gasoline in its chief uses. Finally, the chief demand for gasoline is dependent upon the demand for gasoline motors; gasoline is not wanted for itself, but as an adjunct to a want for other things. The result is that the quantity of gasoline demanded is less responsive to changes in the price of gasoline than would otherwise be the case. Taken together, these general characteristics all show a rather highly inelastic demand. The consumer can, for a time at least, be made to bear high prices without recourse either to substitutes or to reduced consumption.

The demand for gasoline is complex. It may be required at any particular time for the following purposes: (1) For the replenishment or increase of refiners' and jobbers' stocks; (2) for export; (3) for domestic consumption in various ways, the chief of which are: (*a*) in internal-combustion engines, or motors, such as automobiles, motor boats, aeroplanes, trucks, railway motor cars, farm tractors, stationary and portable engines, and the like; (*b*) in the manufacture of varnish and paint; (*c*) in the cleaning industry; (*d*) in gasoline stoves; and (*e*) in the manufacture of rubber and some other products requiring a solvent. Ultimately, of course, the demand all comes from the various uses indicated under the third head, but during any short period it can well be that a speculative demand by dealers may play a distinct part in the situation.

It will be noted that, with one exception, all of the ultimate sources of demand are either of recent origin or have shown great growth during recent years. The one exception is stove gasoline, the use of which, owing to the use of gas and other substitutes, does not appear to be increasing. Gasoline engines of all sorts have multiplied with great rapidity; "varnish makers' and painters' naphtha" has to a large extent replaced the spirits of turpentine of our fathers, while the spread of "dry cleaning" establishments is a matter of common observation. Probably the largest single factor on the demand side is the automobile. The most important statistics showing domestic demand, therefore, are those showing the production of automobiles and their consumption of fuel.

Section 2. Statistics of demand for gasoline for motor purposes.

It is commonly estimated[1] that the number of automobiles produced in 1914 was 515,000; in 1915 it was 890,000; and for 1916 a production of 1,400,000 cars is anticipated. But of more significance is the number of cars in use during the year, on which point the record of motor-car licenses is available,[2] and this, combined with an estimated average consumption per car of 450 gallons, gives results as follows:

	Gallons.
1912, 848,000, at 450 gallons per year	381,600,000
1913, 1,191,000, at 450 gallons per year	535,950,000
1914, 1,508,000, at 450 gallons per year	678,600,000
1915, 2,075,000, at 450 gallons per year	933,750,000

It is estimated that on January 1, 1916, there were over 2,225,000 automobiles in use in the United States. The figures indicate an increase in consumption of gasoline by automobiles in 1915 of 38 per cent over 1914 and of 74 per cent over 1913. Though but unofficial estimates, these statistics are fairly suggestive of the large increase in consumption of gasoline by motor cars.

The Commission, desiring to test the unofficial estimates, sent out a schedule of questions to the leading manufacturers of gasoline engines and motors in the United States and to thousands of representative garages scattered over the entire country. The following table indicates the growth of the gasoline motor business during the last three years. Returns showing foreign and domestic sales were received from more than 270 American manufacturers of gasoline engines, including all the large producers of automobile motors. As the motors varied in horsepower, and consequently in gasoline consumption, the total average horsepower has been computed and percentages of increase are based on these figures. The results can be taken as only approximately correct, as some firms

[1] E. g., see National Petroleum News, April, 1916.

[2] See California Derrick, January, 1916, p. 28; Oil, Paint and Drug Reporter, Feb. 14, 1916, p. 35. Both higher and lower figures have been published. Those shown are believed to be conservative.

which were not in business in 1915, and from which no reports were received, sold motors in 1913 and 1914. This fact undoubtedly makes the per cent of increase somewhat high.

TABLE 3.—SUMMARY OF DOMESTIC SALES AND HORSEPOWER OF MOTORS REQUIRING GASOLINE FOR MOTIVE POWER, 1913, 1914, AND 1915.

Product.	1913		1914			1915		
	Number sold.	Total horsepower.[1]	Number sold.	Total horsepower.[1]	Per cent of horsepower increase over 1913.	Number sold..	Total horsepower.[1]	Per cent of horsepower increase over 1914.
Automobiles and motor trucks	318,773	7,561,972	446,508	10,449,825	38	725,372	17,263,337	65
Tractors	2,532	76,491	2,965	99,454	30	7,145	200,380	101
Stationary and portable engines	113,966	1,213,117	136,134	880,283	[2] 27	215,623	2,931,584	233
Power boats	128,110	2,427,563	130,330	2,457,769	1	110,748	2,129,557	15
Total	563,381	11,279,143	715,937	13,887,331	23	1,058,888	22,524,858	62

[1] Includes estimated horsepower for companies not reporting same. Obtained by using average of those reporting average horsepower.

[2] Decrease.

It appears from the table that the rate of increase in total horsepower for the year 1914 over 1915 was approximately 62 per cent, the rate for tractors and stationary and portable engines being highest. The great total horsepower of automobiles and motor trucks and their more frequent and regular use, however, made them the dominant factor. The increase between 1913 and 1914 was also considerable, especially in automobiles and tractors. This inquiry substantiates the foregoing estimate based on automobile licenses.

Returns from over 1,000 garages in all sections of the country reporting their monthly sales of gasoline for the last six months of 1914 and 1915 are as follows:

Month.	1914	1915
	Gallons.	*Gallons.*
July	2,519,399	3,371,460
August	3,268,336	3,045,905
September	2,403,152	2,902,406
October	2,228,016	2,683,070
November	1,867,572	2,256,895
December	1,478,847	1,794,573
Total	13,765,322	16,054,309

The figures indicate a considerable increase in consumption of gasoline by motor cars. The totals are, respectively, 13,765,322 gallons and 16,054,309 gallons, an increase of over 16 per cent.

Section 3. Sales of gasoline by refiners.

The movement of sales of gasoline and naphtha during the last three years, as reported by refiners, points in the same direction. All refiners were requested to state their total sales of gasoline and naphtha to jobbers and consumers during the last five years. The returns from refiners who reported were so incomplete back of 1913, however, that it does not seem well to present the totals. The figures for 1913, 1914, and 1915 follow:

TABLE 4.—SALES OF GASOLINE AND NAPHTHA BY REFINERS REPORTING TO THE COMMISSION, 1913–1915.

Year.	Standard refiners.	Per cent of increase.	Other refiners.	Per cent of increase.	All refiners.	Per cent of increase.
	Gallons.		*Gallons.*		*Gallons.*	
1913	824,987,000	.....	274,363,000	.....	1,099,350,000	.....
1914	919,058,000	11.40	412,172,000	50.23	1,331,230,000	21.09
1915	1,221,805,000	32.94	627,985,000	52.36	1,849,790,000	38.95

The figures show an increase in sales by refiners to jobbers and consumers of over 38 per cent between 1914 and 1915. Though the percentage of increase in sales by non-Standard refiners was greater than that in sales by Standard refiners, the absolute increase was less, the quantities being 215,813,000 gallons and 302,747,000 gallons, respectively. It is probable that non-Standard refiners, moreover, sold a larger proportion of their gasoline to Standard jobbers in 1915 than the Standard refiners sold to non-Standard companies. Members of the Western Jobbers' Association have stated that they do not usually buy of Standard companies and were unable to do so in 1915; while it is known that Standard companies bought over 5,830,000 gallons from a group of 11 Mid-Continent "independents" alone. (See Table 34, p. 133.)

Section 4. Exports.

According to the reports of the Bureau of Foreign and Domestic Commerce, of the Department of Commerce, the exports of gasoline products—including naphthas and benzines—in 1915 amounted to 282,331,474 gallons, valued at $33,925,589. This quantity was about 14 per cent of the estimated gasoline content of all crude oil produced in the United States during the year, and over 15 per cent of the gasoline and naphtha sold in 1915 by refiners reporting to the Commission.

The Bureau reports exports of gasoline products for 1914 as 209,692,655 gallons, valued at $25,288,414, a figure which indicates that the 1915 exports were an increase of 72,639,000 gallons, or 35 per cent over those of the preceding year. A majority of the

months of 1915 showed an increase over the corresponding months of 1914, but August was the leading month, its exports being 33,067,432 gallons. The monthly average was over 23,500,000 gallons. After August the quantity exported shows a decrease, however, and the difference between the 1915 and 1914 figures is not large as compared with the 518,000,000 gallons increase in domestic sales. For the first four months of 1916 the average exports were only 20,842,000 gallons.

The facts as reported by the Bureau are shown in more detail in the following table, which also shows the annual totals for the last three years:

TABLE 5.—EXPORTS OF GASOLINE PRODUCTS (GASOLINE, NAPHTHA, AND BENZINE, COMBINED), 1913, 1914, AND BY MONTHS, 1915 AND 1916.

Month.	Quantity.	Month.	Quantity.
1915.	*Gallons.*	1915.	*Gallons.*
January	13,624,708	December	22,895,570
February	23,346,701	1916.	
March	22,034,941	January	17,129,972
April	24,259,214	February	17,737,600
May	25,117,025	March	28,644,240
June	28,372,830	April	19,856,835
July	24,947,975		
August	33,067,432	Annual totals:	
September	21.035,160	1915	[1] 282,331,474
October	18,543,754	1914	209,692,655
November	27,424,510	1913	188,043,379

[1] Total for 1915 is the figure as corrected by the Bureau at the end of the year and does not equal the total of the figures for the months.

The monthly summary of exports, published by the Bureau of Foreign and Domestic Commerce, does not distribute the total exports of naphtha and benzine[1] among the countries to which they go. It shows, however, the countries to which "gasoline" is exported. In 1914, when the exports of gasoline amounted to 163,000,000 gallons, the three largest purchasers were the United Kingdom with 36,000,000, Canada with 33,000,000, and France with 32,000,000 gallons. In 1915, when the "gasoline" exports were 113,000,000 gallons, Canada took 34,000,000 gallons, the United Kingdom 19,000,000, and France 14,000,000 gallons. While the gasoline exports decreased, the exports of naphtha and benzine increased from 47,000,000 gallons in 1914 to 170,000,000 in 1915. It is not known what countries purchase our naphtha and benzine, but it is assumed that the bulk of it goes to the United Kingdom and France, since the months showing a decrease in exports of gasoline show a corresponding increase in naphtha. The exports to both Belgium and

[1] The terms "naphtha" and "benzine" may be taken as equivalent to "low-gravity gasoline."

Germany, previously heavy buyers of gasoline, were entirely cut off in the summer of 1914; while trade with the Netherlands materially decreased.

All important refineries reported to the Commission their sales of all gasoline products for export to the amount of 209,546,844 gallons during 1914 and 315,478,565 gallons for 1915. The figures for 1915 represent an increase of 50 per cent over those for 1914. It will be noted that these figures and the percentage of increase are larger than those reported by the Bureau of Foreign and Domestic Commerce. This excess may be accounted for, to some extent—though not entirely—by the fact that some companies may have reported the quantity sold to others for export as well as the quantity exported themselves, with the result that some duplication appears.

The Commission's figures indicate that in 1915 the exports were 20 per cent of the reported production, and in 1914 they were approximately 18 per cent.

Five Standard companies reported exports of 174,539,613 gallons of gasoline products in 1914. The same companies reported 254,494,818 gallons in 1915, an increase of over 45 per cent. Three other Standard companies, reporting no exports for 1914, exported 6,801,855 gallons in 1915. Thus eight Standard companies reported exports of 261,296,673 gallons, or approximately 83 per cent of total gasoline exported in 1915.

Eleven other companies exported 35,007,231 gallons in 1914, and 48,909,239 in 1915, an increase of 40 per cent. Six of these "independent" companies, who reported no exports for 1914, exported 5,272,653 gallons in 1915. Thus 17 "independent" concerns exported 54,181,892 gallons, or 17 per cent of the total gasoline exported in 1915.

The largest exporter of gasoline products was the Standard of New Jersey, whose figure was 179,982,931 gallons, or 57 per cent of the total exports in 1915.

The following table shows the exports of gasoline products as reported to the Commission by the refiners:

TABLE 6.—EXPORTS OF GASOLINE PRODUCTS AS REPORTED TO THE FEDERAL TRADE COMMISSION, 1914 AND 1915.

Year.	Standard companies (8 companies).		Other companies (17 companies).		Grand total (25 companies).	
	Quantity.	Per cent.	Quantity.	Per cent.	Quantity.	Per cent.
	Gallons.		*Gallons.*		*Gallons.*	
1914	174,539,613	83.3	35,007,231	16.7	209,546,844	100.0
1915	261,296,673	82.8	54,181,892	17.2	315,478,565	100.0

Thus it is evident that in addition to the increased domestic demand, there was some increase in the volume of gasoline products withdrawn from the domestic market for sale abroad; and this export movement reached its height about the time that prices of gasoline began to rise sharply in the United States. After August, 1915, however, the quantity of gasoline products exported decreased; and the percentage of exports to production was but little greater in 1915 than in 1914.

Section 5. Export prices.

The Fuel Oil Journal (April, 1916, p. 16) says: "Late in February [1916] the Standard Oil Co. of New York advanced the price of gasoline for export 1 cent a gallon, all grades and packages, but otherwise prices have held firm at former quotations," and indications are that the actual prices received for export gasoline were in advance of market quotations. According to the Oklahoma City Times, an Oklahoma refining company was offered 31 cents per gallon for gasoline for a quantity of 400 tons delivered on shipboard at New Orleans. (Oil and Gas Journal, Apr. 6, 1916.) One correspondent wrote the Commission as follows: "We are informed, whether truly or not, that exporters are willing to pay a premium over any price the domestic market will pay or can afford to pay." The same person stated that export business is "cash as soon as the tank car is loaded." The Fuel Oil Journal (March, 1916), after stating that perhaps 50 per cent of the February gasoline output from the wells around Tulsa and Cushing, Okla., was for export, said: "The export trade paid the best price and could have gotten more gasoline than it did." A large refining company and exporter reports to the Commission that it had refused an offer in January, 1916, for 250,000 gallons of gasoline at 17 cents per gallon, f. o. b. boats at Sabine, Tex., and that it sold 10,000 barrels in April, 1916, at 18 cents per gallon f. o. b. boat at Beaumont, Tex.

With such a demand abroad, it is clear that domestic prices would be stiffened and tend to rise to a point set by what foreign purchasers were willing to pay, though no higher.

The following is a summary of the annual average export price f. o. b. refinery for 1914 and 1915, as reported to the Commission by the refiners:

	1914	1915
	Cents.	*Cents.*
Standard Oil companies (8 refineries)	10.94	10.62
Independent companies (14 refineries)	8.86	9.27
Total (22 refineries)	10.70	10.43

Analysis of the monthly export prices of gasoline during 1915 shows little change until August. There was a material increase in export prices from August to December, 1915. The monthly average values published in the monthly summary by the Bureau of Foreign and Domestic Commerce increased from 11.4 cents per gallon in August to 14.6 cents in December, an increase of over 28 per cent. The market price as indicated by the weekly quotations published in the Oil, Paint, and Drug Reporter, which are for high Baumé test gasoline f. o. b. New York, increased from 18.25 cents per gallon on August 15 to 24.75 cents on December 15, an increase of over 35 per cent. The f. o. b. refinery export prices of motor gasoline of the Standard of New York increased from 10.77 cents per gallon in August to 15.09 cents in December, an increase of 40 per cent. The f. o. b. refinery [1] export price of motor gasoline of the Standard of New Jersey increased from 11.34 cents per gallon in August to 13.45 cents in December, an increase of only 2.11 cents per gallon, or 18 per cent. These two companies, however, have different export markets.

Export prices have, as a rule, increased more slowly than the domestic prices. A large refiner and exporter explained that the average export price does "not reflect the market prices in all cases, being largely influenced by the cargoes delivered during a particular month under prior contracts covering a number of months," the price being controlled by the market price existing at the time of the contract. This company exported some gasoline in December at 7¾ cents per gallon under a contract made in June. The following table, showing the monthly average f. o. b. refinery prices of the Standard of New Jersey, illustrates the trend of export prices as compared with domestic prices during 1915:

TABLE 7.—MONTHLY AVERAGE EXPORT AND DOMESTIC PRICES OF GASOLINE, F. O. B. REFINERY, AS REPORTED BY THE STANDARD OF NEW JERSEY, 1915.

Month.	Average export price.	Average domestic price.	Month.	Average export price.	Average domestic price.
1915.	*Cents per gallon.*	*Cents per gallon.*	1915.	*Cents per gallon.*	*Cents per gallon.*
January	11.34	8.77	August	11.34	10.67
February	11.47	8.87	September	11.78	12.12
March	11.39	9.30	October	13.02	12.59
April	11.41	8.74	November	12.94	13.74
May	11.49	8.96	December	13.45	15.89
June	11.16	9.10	Increase, August–December	2.11	5.22
July	11.14	9.25			

[1] F. o. b. refinery prices are as reported by the refineries and are fairly indicative of the prices at which sales were actually made f. o. b. the refinery, as sales are generally made in this industry.

The following table shows the monthly export prices—first, as published in the monthly summary of exports (Bureau of Foreign and Domestic Commerce); and second, the export prices of the Standard of New York (as reported to Commission). The figures show a similar trend, but differ in amount because of difference in the quality of the product and in amount of freight included. At the end of the table is shown the increase in price from August to December, 1915.

TABLE 8.—MONTHLY AVERAGE EXPORT PRICES OF GASOLINE, 1914 AND 1915.

Month.	Monthly average value from Monthly Summary (Bureau of Foreign and Domestic Commerce).		Motor gasoline, Standard of New York.	
	1914	1915	1914	1915
	Cents.	*Cents.*	*Cents.*	*Cents.*
January	15.2	12.0	11.92	10.98
February	14.1	11.2	12.16	11.13
March	14.2	11.8	12.04	10.87
April	14.5	10.0	12.02	9.30
May	12.5	10.3	11.69	9.52
June	12.4	10.7	11.37	10.63
July	11.5	10.9	11.27	10.95
August	11.5	11.4	10.95	10.77
September	10.6	12.7	10.92	12.84
October	10.9	[1] 10.4	10.93	13.04
November	11.2	14.2	11.00	13.34
December	11.2	14.6	10.98	15.09
Increase, August-December	.....	3.2	.....	4.32

[1] The October average value of the Bureau of Foreign and Domestic Commerce is out of line with the export prices of the Standard of New York and the Standard of New Jersey (Table 7).

As already stated (p. 35), export prices increased more slowly than domestic prices, and this point has sufficient importance to call for emphasis. The accompanying diagrams (diagrams 7 and 8) show the relative movement of the export and domestic prices. In diagram 7 the domestic and export prices of the same companies, the Standard of New Jersey and the Standard of New York are compared. In both cases the same thing happened; down till some time in August the export price was higher than the domestic, when the relation was reversed. The advance between August and December, 1915, was 2.11 cents in the monthly average export price and 5.22 cents in the monthly average domestic price. The reason for this difference is not clear. The retarding effect of existing export contracts doubtless explains it in part, though refiners did not desire to make long contracts on an unsettled market, and the contracts were generally for prompt delivery. Such contracts, however,

DIAGRAM 7. RELATIVE MOVEMENT OF THE AVERAGE MONTHLY DOMESTIC AND EXPORT PRICES OF GASOLINE, F. O. B. REFINERY, RECEIVED BY THE STANDARD OIL COMPANIES OF NEW YORK AND NEW JERSEY, 1915.

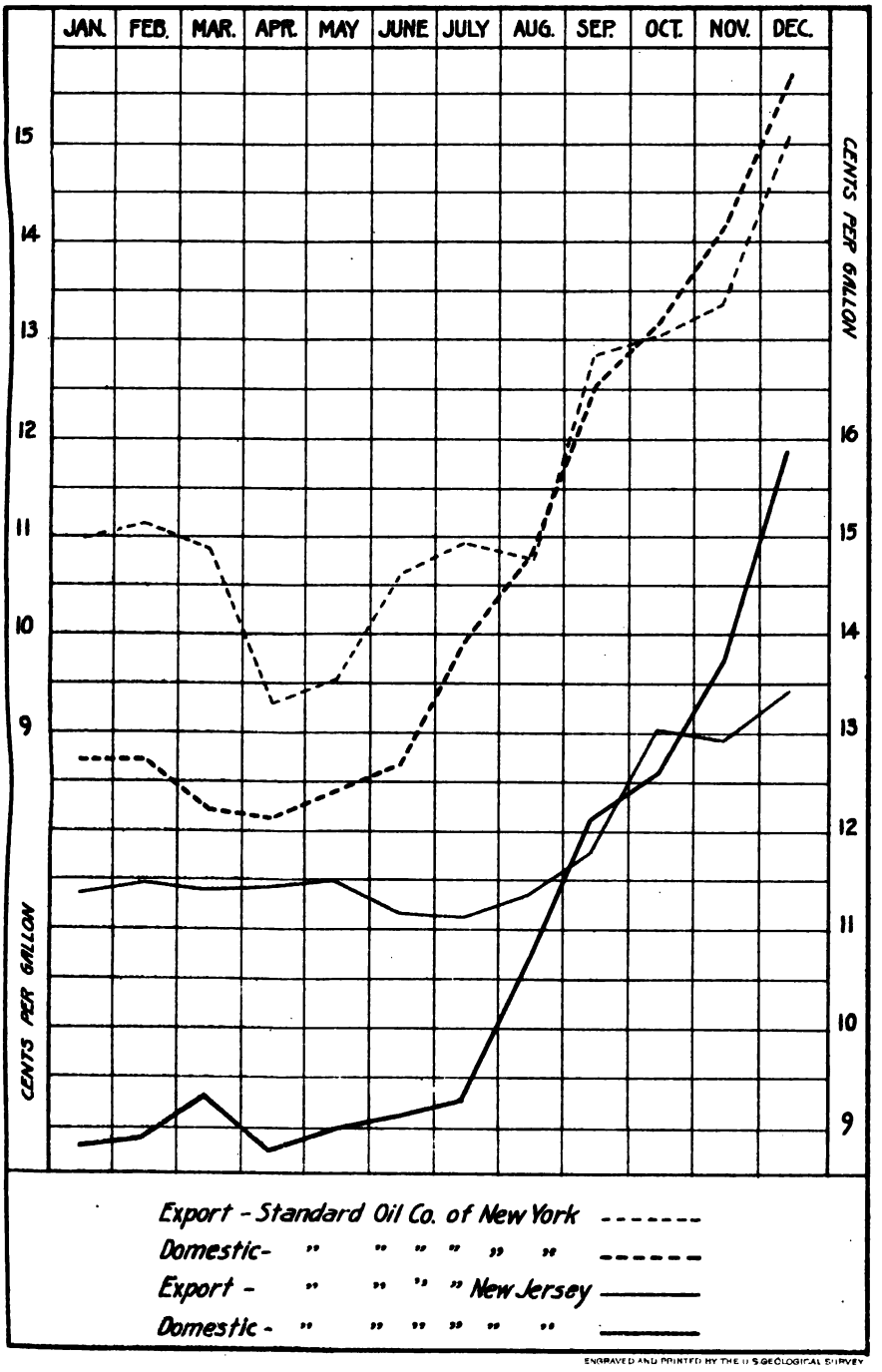

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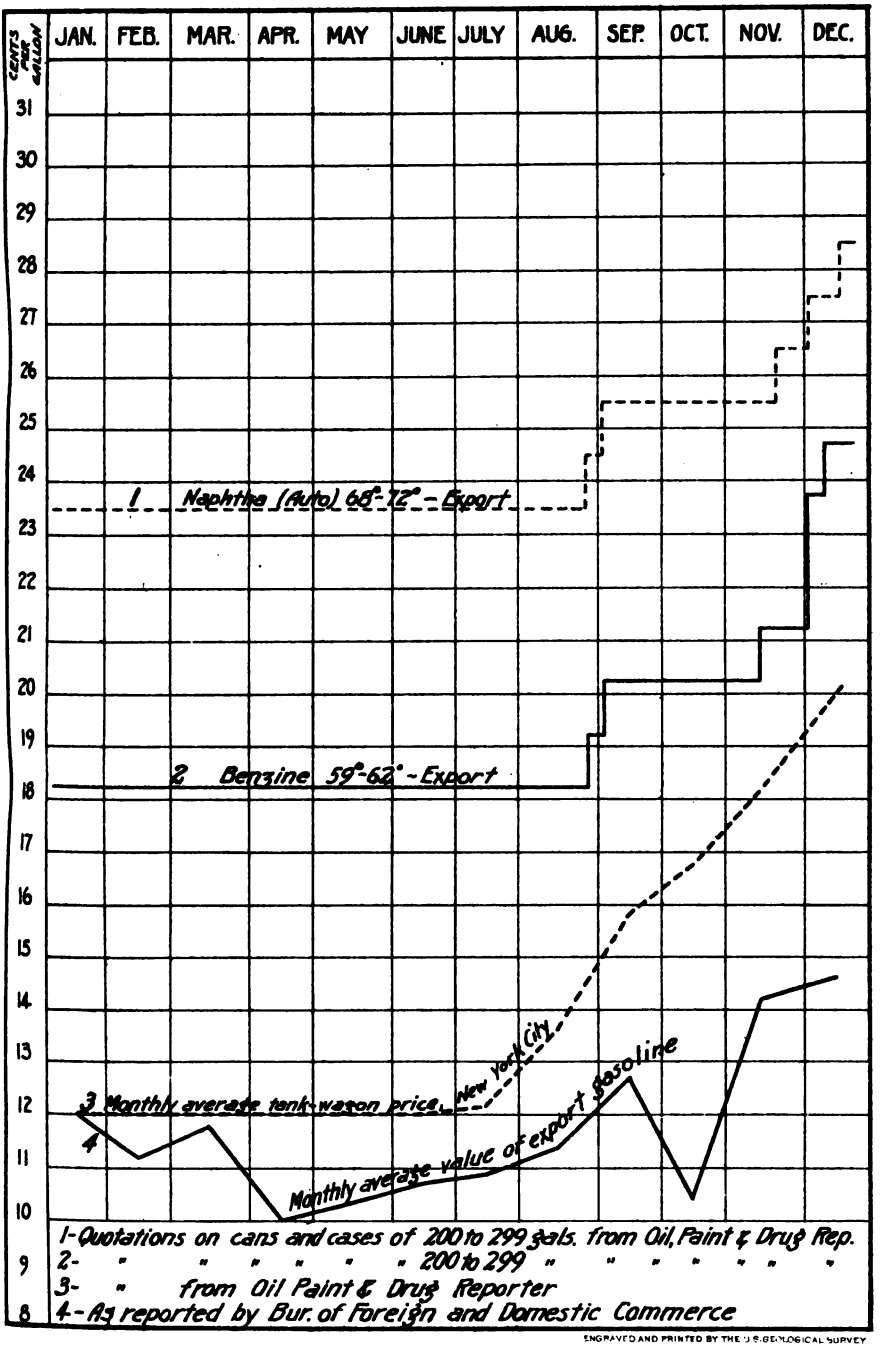
DIAGRAM 8. EXPORT PRICES OF GASOLINE PRODUCTS COMPARED WITH THE MONTHLY AVERAGE TANK-WAGON PRICES AT NEW YORK CITY, 1915.



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would undoubtedly tend to make the reaction slower. Diagram 8 shows the general price as reflected in market quotations, and in a general way corroborates Diagram 7. Being based on data published in trade papers, however, it is less authoritative than the preceding diagram.

The difference in prices between eastern and western points in the United States is emphasized by the export situation. While the New York and New Jersey companies' domestic prices f. o. b. refinery were higher than their export prices, the reverse was the case with the Mid-Continent and Gulf Coast refiners. Table 33 (Statistical Exhibits) shows that the December refinery prices of the latter averaged 12.17 and 11.63 cents, respectively, as compared with 14.37 cents at eastern refineries. These facts help explain why the export market looked so attractive to Mid-Continent refiners in early 1916, as indicated in the foregoing quotations.

Section 6. Low demand during winter of 1914–1915 followed by an increase.

One feature of the demand side of the problem is suggested by the export statistics, namely, the diminished intensity of demand which existed during the latter part of 1914 and the early months of 1915. This diminished intensity is of importance because it was partly responsible for the low prices which prevailed in the early part of 1915.

Two causes of the low point existed. The first, which was relatively unimportant, was the diminution in exports to Europe as a result of the outbreak of war in the summer of 1914. Shipments were checked for some time, so that exports of volatile mineral oils for May, June, and July combined were 78,437,830 gallons, and for August, September, and October, 72,646,346 gallons, a decrease of 5,791,484 gallons. This decrease, however, was followed by an increase in the first half of 1915.

The second cause was the general bad weather during the first half of 1915, which resulted in a less use of automobiles. This point brings out the fact, sometimes overlooked, that the demand for gasoline products is not exactly in proportion to the number of gasoline engines or motors in existence, but that it varies with the frequency or regularity of the use of such engines. Thus, as a result of the heavy rains and bad roads that prevailed throughout large parts of the country during the earlier months of 1915, automobile traffic was checked, sales of gasoline did not show the increase that might have been expected, and stocks of gasoline accumulated in the hands of refiners and jobbers.

If the foregoing conditions of demand tended somewhat to keep prices low at the beginning of 1915, changes developed about the

middle of the year that tended to pull prices up. In the first place, conditions were soon such that the war demand became effective and the exports of gasoline products increased from 13,600,000 gallons in January, 1915, to 28,300,000 gallons in June. In August the exports amounted to over 33,000,000 gallons, or considerably more than double the quantity exported in January. In the second place, weather conditions had so changed meanwhile, especially in the Middle West, as to cause a great increase in automobile mileage. Till late in the fall the roads remained in good condition. As a result sales of gasoline showed a sharp increase, and from July to September were unusually large.

On the basis of returns from some 1,500 garages in all parts of the country, the maximum domestic sales of gasoline for motor vehicles during 1915 can be said to have occurred in July, though sales held up fairly well till October. Returns from 1,642 garages are available for a shorter period and give the following results for 1915:

	Gallons.
August	4,626,431
September	4,412,875
October	4,320,752
November	3,369,242
December	2,542,518

The foregoing facts indicate a tendency on the demand side, first to low prices down through June and to an increase between then and October. Exports decreased in September and October, however, and sales fell off sharply after October.

It remains to be noted that the winter of 1915–16 was marked by widespread appearance of the "all-year" car. The existence of improved facilities for closing cars to the weather, of perfected motors, and better roads, together with the formation of habits of use, led to the continuous use of the automobile throughout the year on an unprecedented scale.

As already stated, the demand of jobbers for stocks may, from a short-time point of view, be regarded as a part of the general demand. According to the Commission's information, a shortage of crude, and consequently of gasoline, was foreseen by many refiners and jobbers as early as May, 1915, and in anticipation of an increased demand by the public, they sought to increase their stocks of gasoline. This may have hastened somewhat the advance in prices; but there appears to be no evidence to support the allegation that gasoline was cornered and that prices were advanced by a speculative holding of stocks thereof. On the contrary, the Commission's statistics show that by June stocks of gasoline ceased to increase, and declined steadily thereafter until they were lower in December than they had been at the beginning of the year.[1]

[1] See diagram facing p. 57 and Statistical Exhibits, Table 27.

Section 7. Effect of high prices on demand.

As a result of the advance in gasoline prices the quantity of gasoline demanded became less than would otherwise have been the case. The Commission addressed a schedule of inquiry to numerous automobile dealers and garages over the country asking for the movement of their sales of motor cars, use of cars, dead storage, and sales of gasoline. Some 2,000 replies were received, showing the following results: 90 per cent reported a decrease in sales of cars, attributing this largely to the increased price of gasoline; over 80 per cent reported decreased use of cars; 70 per cent reported increased dead storage; and 75 per cent stated that sales of gasoline had decreased. These statements are borne out by the reports of monthly sales of gasoline by garages, which indicate that the January, February, and March sales were less in 1916 than in 1915, in spite of the inelastic character of the demand.

It is of some interest to note that in the northeastern States, where prices were the highest, the effect of the advance in prices was most marked; while on the Pacific coast and in Texas there was less change. In California, where prices were lowest during 1915, the reports indicate the smallest decrease in use of cars, and only a very slight decline in consumption of gasoline. In Ohio, a State in which prices were higher than in most others, the reports almost unanimously indicate decreased use of cars and gasoline.

The sales of gasoline in different sections of the country as reported by garages substantiate these conclusions: (1) Sales in Standard of Indiana territory, where prices were relatively low, fell off less in the latter part of 1915 than in Ohio; (2) Pacific coast territory showed relatively little decline, and was more steady throughout the year, showing the result of climate and winter touring; (3) the more regular quantity of sales throughout the South was apparently also due to climatic conditions.

In general, this part of the Commission's investigation shows a close relation between the degree of advance in price and the decrease in quantity of demand for automobiles and motor fuel. Although it will be remembered that automobile dealers would tend to magnify the bad effects of high prices on their business, this parallelism lends weight to the results secured.

One force, therefore, tending to equalize the demand for gasoline with the supply, was the adjustment being made in the demands of ultimate consumers.

II. SUPPLY.

It is after all in supply conditions that the chief explanation of advances or other variations in the price of gasoline products must be sought, because the demand for gasoline, taken on the whole, has been constantly increasing since its use as motor fuel.

Section 8. Production and stocks of gasoline products, 1914 and 1915.

The total quantity of gasoline and naphtha ("gasoline products") produced each year by refiners reporting to the Commission was 1,180,789,104 gallons in 1914 and 1,548,799,482 gallons in 1915, an increase of 31 per cent. Most of the refiners, in addition to reporting their total for the year, also returned the quantity produced each month of 1915, and the monthly totals are shown in the following table:

TABLE 9.—QUANTITY OF GASOLINE PRODUCTS (GASOLINE AND NAPHTHA) PRODUCED BY REFINERIES REPORTING TO THE COMMISSION, BY MONTHS, 1915.

Month.	Gallons.	Month.	Gallons.
1915.		1915.	
January	102,163,809	August	126,760,142
February	91,414,804	September	122,971,122
March	106,185,395	October	130,664,877
April	113,187,880	November	127,551,860
May	122,327,363	December	128,541,081
June	125,693,178		
July	129,861,381	Total	1,427,322,892

It will be noted that there was considerable variation in the quantity produced monthly during the first half of the year, but a comparatively steady production during the second half of the year. The production in the second six months was greater than in the first.

Table 25, page 191, in the Statistical Exhibits gives further details concerning the production of gasoline in 1915. That table does not include naphtha, and the figures are somewhat smaller than those presented in the preceding table, but it shows a similar trend.

In addition to the gasoline products produced in the United States, a relatively small quantity is imported. During 1915, according to the Bureau of Foreign and Domestic Commerce, the imports of gasoline, naphtha, and benzine totaled 7,920,504 gallons, or about half the quantity annually imported the preceding three years. Most of these imports entered through Pacific coast ports, and more than half came from the East Indies.

The quantity immediately available for market depends also on the stocks carried by refiners and jobbers. The stocks of gasoline and naphtha of all refiners and jobbers reporting to the Commission were

279,064,829 gallons on January 1, 1915, and 211,716,971 gallons on January 1, 1916. Most of the refiners and jobbers, in addition to reporting their stocks on January 1, 1916, also returned their stocks on hand at the beginning of each month, which returns are shown in the following table:

TABLE 10.—STOCKS OF GASOLINE PRODUCTS (GASOLINE AND NAPHTHA) HELD BY REFINERS AND JOBBERS REPORTING TO THE COMMISSION, BY MONTHS, 1915.

Month.	Gallons.	Month.	Gallons.
1915.		1915.	
January	279,064,829	August	278,586,109
February	303,201,311	September	237,661,631
March	328,615,099	October	205,720,348
April	346,393,405	November	196,568,604
May	338,754,327	December	184,577,456
June	328,983,082	1916.	
July	303,611,147	January	203,951,888

Table 27, page 192, in the Statistical Exhibits gives further details concerning the stocks of gasoline on hand during 1915. As the table presented herewith covers gasoline and naphtha ("gasoline products") the figures are somewhat larger than those for gasoline alone, but show similar movements.

Section 9. Stocks and production of crude oil.

The supply of gasoline depends upon the supply of crude oil. Not only is the quantity of gasoline dependent upon the quantity of crude, but its cost of production consists chiefly of the price of crude. It is therefore essential to present some facts concerning the production and stocks of crude oil as a basis of understanding the gasoline situation.

The production of crude oil in the United States was 301,527,000 barrels of 42 gallons in 1914, and 305,952,000 barrels in 1915. Stocks on hand on December 31, 1914, were 141,549,769 barrels, and on December 31, 1915, 185,634,143 barrels. The gasoline content of the crude oil produced in 1915, together with about 75,000,000 gallons of gasoline extracted from natural gas (casing head gasoline), has been estimated by the Commission to have been 2,059,000,000 gallons. The following table shows the monthly stocks, production, and estimated gasoline content of crude oil, exclusive of 986,000 barrels (an estimated quantity of crude oil run by three independent refineries at Shreveport, La., which it was not possible to segregate by months) and the 75,000,000 gallons of casing head gasoline.

TABLE 11.—STOCKS OF CRUDE OIL ON HAND, PRODUCTION OF CRUDE OIL, AND ESTIMATED GASOLINE CONTENT OF CRUDE OIL PRODUCED, BY MONTHS, 1915.

Month.	Stocks of crude oil on hand at end of each month.	Production of crude oil in the United States.	Estimated gasoline content of crude oil produced.
	Barrels.	*Barrels.*	*Gallons.*
January	160,207,042	25,702,000	175,607,880
February	163,479,860	22,946,000	151,237,170
March	163,374,608	25,843,000	174,700,890
April	170,087,881	27,001,000	191,776,410
May	173,926,328	26,398,000	181,653,990
June	175,443,605	26,579,000	185,659,740
July	191,205,591	26,144,000	172,093,950
August	188,217,484	25,377,000	164,377,500
September	187,182,158	24,130,000	148,076,460
October	190,366,573	24,835,000	145,263,510
November	188,039,342	24,478,000	139,753,530
December	185,634,143	25,533,000	145,601,190

Thus, while the production of crude oil remained nearly constant each month throughout 1915 and the stocks of crude on hand increased, the gasoline content of the crude produced declined somewhat. The estimated content, however, does not allow for improvement in refining methods.

Tables 13–22 (pp. 183–189) and Table 24 (p. 191) in the Statistical Exhibits show in further detail information concerning stocks, production, and gasoline content of crude oil.

Section 10. Supply conditions and the recent advance in prices.

To begin with, the rise in prices that set in about July, 1915, was preceded by a decline and a low level of prices for both crude oil and gasoline, and this decline was chiefly the result of a great increase in the supply of light (gasoline yielding) crudes. Naturally, the price of such crudes declined and a decline in gasoline prices followed, though it was not so great as the decline in crude. As early as the middle of 1914 Oklahoma producers were facing a situation that might be called one of overproduction. Between May 1, 1914, and the end of February, 1915, the daily production of Kansas-Oklahoma fields jumped from 221,000 barrels to 391,000 barrels. (See diagram 9, facing p. 48.) The maximum was reached about June 3, with an average daily production of 395,000 barrels, chiefly on account of the tremendous output of light crude from the celebrated Cushing pool. Largely as a result of this movement, the total estimated gasoline content of United States crude petroleum production rose to a maximum of over 190,000,000 gallons in April, 1915. Consequently, the market price of Oklahoma crude fell from $1.05 a barrel in April, 1914, to 40 cents in February, 1915; and the price of 60°–61°

gasoline at the refinery in Oklahoma fell from 10½ cents to 6 cents a gallon during the same period. These low prices prevailed until about the end of July, 1915. The 1915 advance in prices must be measured from a low point.

This decline was furthered by a condition of unusually keen competition in the refining and marketing of petroleum products, a condition that was most marked in the Middle West and notably in the Kansas-Oklahoma region. As the supply of light crude increased during 1914 and early 1915, and its price decreased toward the end of that time, the margin of profit to be gained from gasoline products increased, with the result that many small refineries were established in the neighborhood of the Oklahoma oil fields and proceeded to skim the gasoline content with little regard to other elements. These "independent" refineries marketed their products largely through separate jobbing concerns, which sprang up by scores throughout the North Central States. There can be little doubt that both refineries and jobbing concerns were multiplied without due regard to normal conditions and at points their competition from a long-time point of view was sometimes excessive. The result was that prices of gasoline were naturally somewhat lower in the Middle West than in the East.

As to the quantity available for market—which, of course, is to be considered in connection with the demand—if exports and imports are ignored, this depends immediately upon stocks on hand and ultimately upon quantity produced. The statistics collected by the Commission show that there was the normal seasonal decline in stocks of gasoline in the hands of refiners and jobbers during the latter half of 1915, the quantity held falling steadily from a total of over 336,000,000 gallons in May to a total of about 179,000,000 gallons in December. Though the quantity of refiner's sales fell off toward the end of the year, yet taken altogether their sales were so far in excess of their production that stocks were drawn upon heavily down to October. Jobbers' stocks, however, though smaller than those held by refiners, did not decrease in the last months of 1915. (See Statistical Exhibits, Table 27, p. 192.)

Added to the domestic sales were the gasoline exports already referred to in the discussion of demand. In August, 1915, the exports equaled nearly 12 per cent of the total stock of gasoline in the hands of refiners and jobbers at the beginning of the month. Thus, the export situation is of some importance in an interpretation of the advance in prices, especially at the beginning. In a period of delicate balance, when supply is lagging or tending to lag behind demand, the withdrawal of a smaller percentage of the available supply from the domestic market might cause an appreciable advance in price.

Much attention has properly been drawn to the fact that the production of gasoline at refineries did not fall off during 1915, but was maintained at a somewhat higher level during the second half of the year. This has by some been considered to warrant in itself the conclusion that no rise in prices was justified. Such a conclusion, however, fails to reckon with the undoubtedly greater domestic demand that prevailed in 1915 as compared with 1914. It also omits a consideration of the increased cost of crude oil. A greater output may legitimately and naturally be sold at an advance in price if produced at a greater cost per unit and the demand is intense enough to stand the advance in price.

Section 11. Deterioration in the quality of gasoline.

It would be quite misleading to conclude a discussion of the supply of gasoline with a mere statement of the number of gallons produced and in stock. The idea that "gasoline is gasoline" is erroneous. The quality of the product must be considered as well as its quantity, for a gallon of very volatile and greaseless gasoline may give much more satisfactory results than a low-grade mixture in the shape of motor spirits, though the latter may also be called gasoline.

In the present state of knowledge concerning motor fuels and performance, it seems impossible to say just what allowance should be made for deterioration in the motor-fuel value of the "gasoline" produced and sold between January 1, 1915, and January 1, 1916. The best that can be done is to indicate the average decline in the gravity of their products as reported by refiners and to make some general allowance for the decline in judging as to the amount of increase in supply. In this connection it is worth noting that in the past the price of gasoline per gallon has varied from 0.25 to 0.5 cent for each degree of gravity, the difference being less in the case of the lower gravities and greater in case the gravities compared are 64° Baumé or over.

In answer to questions concerning the Baumé test of the gasoline produced by them during recent years and during 1915, refiners producing a large part of the gasoline sold in the United States report a very general decrease in the average test of their products. Between 1913 and the end of 1915 the decreases ranged from 0.5° to 8° Baumé, 2° being the most common. During the year 1915 alone the returns indicate a decrease of about 1.5° in the Baumé test, thus showing that in most cases such deterioration as took place occurred during the last year. It is believed that it is conservative to say that the average gallon of volatile mineral oil sold under the name of gasoline had a Baumé test at least 1.5° lower in December, 1915, than it had in January of the same year.

It is to be observed that gravity is not an adequate test of quality. Moreover, motor design and carburetors have recently been adapted

to get more satisfactory results from low-test and blended gasolines. The motors in use during 1915, however, are the ones to be considered; and there can be little doubt that on that basis the changes in quality of gasoline that took place may correctly be called "deterioration."

Section 12. Cost of refining.

Cost is one of the chief elements in determining supply and price. Price can not long remain below cost, and under competition large margins above cost tend to increase production. The chief element in the cost of producing gasoline is the raw material—crude oil. The percentage that crude oil is of the total cost varies with the cost of crude—the higher the cost of crude the greater is its percentage of the total. Roughly speaking, the cost of the crude in 1915 formed about 80 per cent of the total cost of producing a gallon of gasoline at the refineries from which the bulk of the country's supply is drawn. It is desirable, first, therefore, to examine the movements in the price of crudes, especially light gasoline-yielding crudes, during 1915, and the part played by such movements in the advance of gasoline prices.

(A) COST OF CRUDE OIL.

An examination of crude prices leads to a study of the demand and supply conditions with regard to petroleum. Just as the supply of gasoline depends, in the last analysis, upon the supply of crude, so the demand for crude under conditions of effective competition depends chiefly upon the demand for the refined products obtained therefrom, among which gasoline is chief.

It is certain that the increased demand for gasoline that came about August 1, 1915, tended to increase crude prices. Not only this, but the increased consumption was doubtless foreseen by the refiners and jobbers, and to some extent was reflected back in the shape of an anticipatory demand for crude.

DECREASE IN PRODUCTION.—On the supply side, it is easy to show that a considerable advance in the price of crude oil—at least of the light crudes—was certain to come. The greatest single source of gasoline-yielding crude was the Cushing pool located in Oklahoma, and its monthly production showed a fairly steady decline after April, 1915. In April, Cushing produced about 8,658,000 barrels of crude, having an estimated gasoline content of over 101,818,000 gallons. In August, the pool produced only 5,619,000 barrels, with a content of gasoline estimated at about 66,079,000 gallons. By December, its production of crude and the gasoline content had fallen to 3,137,000 barrels and 36,891,000 gallons, respectively. The significance of this decline will be apparent when it is observed that in its days of largest production Cushing crudes yielded over 50 per cent of the gasoline manufactured in the United States.

More than this, while demand was increasing, the production of crude in the fields east of the Mississippi decreased somewhat between April and November, 1915, and north Texas crude production fell off gradually, but steadily, after May. In short, the total crude production of the country, which would have yielded about 191,776,000 gallons of gasoline in April, 1915, had a potential yield of only 145,601,000 in December, a decrease of about 25 per cent. This is on the assumption that the same refining methods were used. The growing use of the Burton process makes the percentage of decrease probably an overstatement.

The effect of the declining output of the Kansas-Oklahoma fields—which include the Cushing pool—was heightened by the movement to accumulate stocks of crude which the prospect of a rising market invited. The decline which began after April was not at once apparent to all, for there were temporary increases in daily production, notably in June; but as early as June, while prices were still at the lowest level, some of the most farsighted and best equipped buyers began to lay in stocks of cheap oil. This oil had accumulated in the hands of producers following the great increase in production in 1914 and in early 1915. Between June and October, 1915, over 29,000,000 barrels of Mid-Continent and eastern crudes were added to storage by pipe-line companies, both Standard and others, and by large Standard producers (Statistical Exhibits, Table 15, p. 185). The increase, however, was drawn almost entirely from Oklahoma and Kansas. These increased stocks were practically all for the various Standard companies, and the Gulf and Texas companies. The total storage reported in the hands of Mid-Continent producers increased in July, but fell off thereafter, so that the total net increase in oil stocks, other than refiners', was only 13,321,000 barrels. Stocks of Cushing crude, which in January, 1915, were 23,313,500 barrels, by December 31 are reported to have increased to 47,249,000 barrels.[1] Refiners' stocks increased during the year by 15,464,000 barrels.

In January, 1916, the Kansas-Oklahoma production fell to less than 300,000 barrels per day, which was probably considerably below the capacity of local Kansas-Oklahoma refiners, and a trade journal[2] reports that the production was some 40,000 barrels a day less than these refiners could take. As a result, a large part of the so-called independent refiners in this territory were working at less than full capacity. The largest pipe-line companies were drawing on storage.

The speculative movement to buy crude, which had begun as early as June, was stimulated by increasing demand and declining production and spread, with the result that the market for crude oil stiffened and discounts from the posted price[3] decreased. On August

[1] Oil, Paint and Drug Reporter, Feb. 14, 1916, p. 49.

[2] Fuel Oil Journal, February, 1916, p. 5.

[3] The price announced by the Prairie Oil & Gas Co. at which it would buy oil from producers. Under normal conditions it is the ruling price in the Mid-Continent field.

2 the largest purchaser of Kansas-Oklahoma crude, the Prairie Oil & Gas Co., advanced its posted price from 40 cents to 50 cents per barrel. The less farsighted or financially weaker refiners appear to have been taken unawares and there followed a veritable scramble for crude—especially Cushing crude. Stocks of Kansas-Oklahoma crude oil held by pipe lines and large allied producers jumped from 53,623,000 barrels in June to nearly 82,000,000 barrels in October, and prices rose rapidly.

During March, April, May, June, and July, the posted price of Oklahoma crude was 40 cents a barrel, and many thousands of barrels were sold at discounts, which brought the price received down to 28 and even 25 cents a barrel. By the middle of December the posted price had risen to $1.20 a barrel, and to this was added in the case of Cushing crude premiums ranging as high as 60 cents, which brought the real price paid by small independent refiners up to $1.80.

Under such circumstances, the smaller refiners were naturally forced to advance the price of gasoline, this being the product that would bear it; and the large refiners were not unwilling to see the rise. As is stated on page 577 of the report on "Petroleum in 1915",[1] published since the preparation of this report:

> The attitude of the larger companies in acquiescing in the advances in price of refined products can be readily understood in the light of the fact that they undoubtedly realized their inability to supply the market for these products were their smaller competitors to go out of business, of the additional fact that their profits were destined to increase with every advance in the price of refinery products because of their possession of crude reserves purchased at rock-bottom prices, and of the further fact that these reserves of crude oil were thus steadily appreciating in value.

ALLEGED CONTROL OF CRUDE PRODUCTION AND PRICE.—It has been alleged that the movements in production and prices just sketched were largely due to the manipulative activities of the purchasing agencies for the Standard companies. To the eyes of some observers a deliberately executed speculative cycle has appeared to exist, in which, after stimulating production by high prices and thus forcing a decline in the market, the Standard companies virtually cornered the supply of cheap crude and then advanced prices again so as to make a handsome profit on their holdings.

Relation between crude oil supply and crude oil prices.—That the Prairie Oil & Gas Co. is the concern which, being the largest purchaser and the source of crude for the dominant refining interests, sets the price on Mid-Continent crude oil that is generally followed, is admitted. A similar function has been exercised by the Joseph Seep Purchasing Agency in the Appalachian fields. Both concerns are known to fix their prices partly with a view to influencing production, raising them when an increased drilling for oil is desired,

[1] Prepared by John D. Northrop, of the United States Geological Survey.

and vice versa. Consequently the production of crude oil will often be found to vary in the same direction (see Diagram 9) as the price, instead of in the opposite direction as is the case in many competitive industries.

In this connection it is to be remembered that the production of crude oil is, like mining, a matter of extracting from the earth limited quantities of nonreproducible materials. Nor is there any way of knowing in advance where petroleum is certain to be found. Unlike many kinds of mining, however, it is impossible after it has been found to know how much petroleum exists in any pool. It follows that the business of the producer is highly speculative in character, and the "wildcatter" has always been an important factor. When prices are high the work of prospecting and drilling is actively prosecuted, and vice versa. With the exception of occasional large "gushers" or very rich pools, therefore, movements in production are largely influenced by prices.

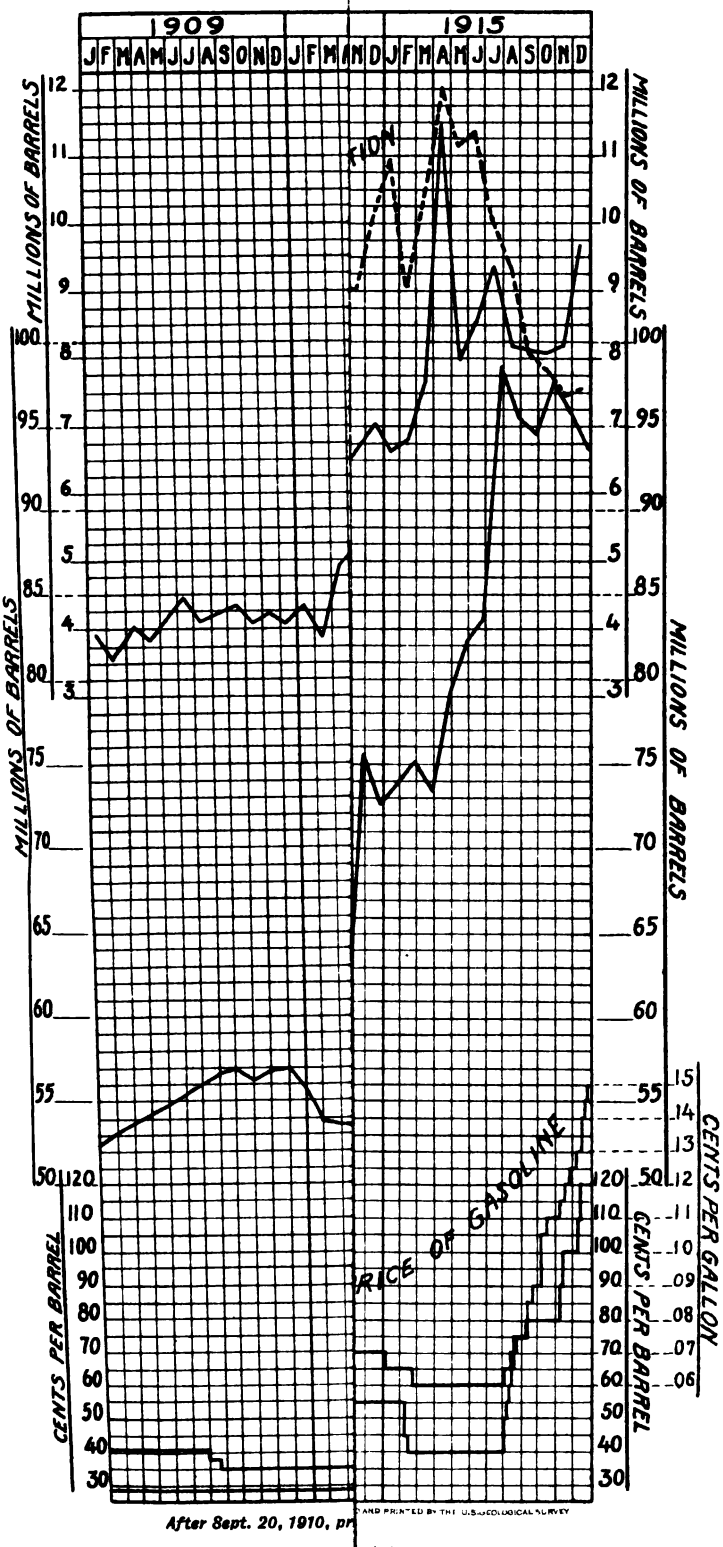
When such finds as the Cushing pool are made, however, the market "runs away," and it is to be remembered that Cushing dominated the market for high-grade petroleum during 1914 and 1915. When, in December, 1913, the Prairie Oil & Gas Co. drilled into the deep-lying Bartlesville sand stratum and brought in a great "gusher," Cushing was hardly foreseen. Yet a year later the pool was producing at the rate of 225,000 barrels a day, with little prospect of immediate decline. In five or six months from this time (December, 1914), the pool was beginning a rapid decline and the field storage was being drawn upon heavily. Such movements in production as this can hardly be the result of manipulation as alleged by some. Such production can neither be foretold nor be choked off profitably when found.

In short, the great general decline in prices of crude that occurred between April, 1914, and March, 1915, in the Commission's judgment, was due to natural causes, the chief of which was the output of the Cushing pool.

This is emphasized for the reason that in part the rise in price of crude that began in August, 1915, is to be regarded as a natural recovery from a condition of oversupply, although it is not so clear that this natural rise in crude prices was not carried beyond a point justified by demand and supply under normal competitive conditions. The Commission has received no conclusive evidence of manipulation by refining or pipe-line interests to increase the price of crude, and the general increase that occurred is capable of explanation on other and more natural grounds.

Increase in stocks.—The unusual element in the situation appears to have been the great increase in stocks held by large producers pipe

DIAGRAM 9. MARKET-OKLAHOMA FIELD, BY MONTHS, 1909-1915; HEALDTON, 1914-1915; AND PRICES



After Sept. 20, 1910, pr

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mission on the Price of Gasoline.

lines, and refiners during the second half of 1915 which has been pointed out, an increase which, coming at a time of declining production of light crudes and on a rising market, was an important element in raising prices. That the increase in stocks was important is apparent, first, because it was large in amount, second, because it was made up of high-grade crudes, and, third, because it came at a time when the production was falling off. The decline in the Cushing pool's production is recognized by all as an important factor, but the increase in crude stocks was several times as large as the decline in Cushing, or as the largest monthly production of that pool. Moreover, the increase in stocks in the hands of the large interests came at a time when Oklahoma production was decreasing, when refiners were scrambling to get crude oil, and when the smaller refiners were obliged to pay premiums ranging from 10 to 60 cents per barrel in order to get enough crude oil to meet their current demands.' At the same time the production of gasoline was not increasing appreciably and sales were actually falling off. At no other time in the history of the petroleum industry in the Mid-Continent field could such large increases in stocks—whether absolutely or relatively to refiners' needs—be found; and rarely, if ever, in the past have stocks increased on a rising crude market.

In this connection the increase in crude oil held by eastern pipe lines for small producers in the Appalachian field deserves mention. As shown in Table 20 in the Statistical Exhibits, the increase in such stocks between May and November was about 160 per cent. Though the total quantities involved were not large, 882,000 barrels to 2,284,000 barrels, the speculative spirit of the producers is made strikingly apparent. It was common gossip in trade papers that they were holding out for "$3 crude."

While some of the various Standard companies were the ones whose stocks of crude show the largest increase, other companies made additions to stocks by purchase or otherwise, as for example the Quaker Oil & Gas Co. (subsidiary of Pure Oil Co.), the Pierce Oil Corporation, and The Texas Co. These purchases may be regarded as legitimate under a competitive system, and their volume was dependent chiefly upon foresight, capital, and enterprise. Millions of barrels of oil were held in storage by producers anxious to sell. Most of this oil appears to have gone to the Standard companies, the purchases by the Standard of Indiana in the early part of the second half of 1915 being especially noteworthy. There is much truth, however, in the dictum of the Oil, Paint and Drug Reporter:

> The price of the oil bought by the Standard was considered high when the sales were made and no one but the Standard people had the courage for a while to buy.[1]

[1] Oil, Paint and Drug Reporter, Feb. 14, 1916.

In a memorandum prepared at the request of the Commission, F. H. Bedford, vice president of the Standard of New Jersey, under date of June 30, 1916, submitted the following statement:

On January 1, 1915, the company had a daily crude production of about 2,000 barrels, with no reserve stocks in storage. It was believed that this condition was uneconomic and that sound business policy made imperative the acquisition of a sufficient production and stored reserve to insure against the contingency of having at any time to shut down or curtail the operation of the company's refineries for lack of crude. The company therefore caused the Carter Oil Co., which was and had been for many years a subsidiary, to qualify to do business in Oklahoma, with a view to acquiring producing territory. Then came the crest of the output in the Cushing field, and this company was importuned by producers to buy the excess of crude which overran their storage capacity. The Carter Oil Co. did, therefore, at the instance of this company, buy some 18,000,000 barrels of oil in tanks. This constituted only about six months' supply for the New Jersey company's refineries, and it is now being drawn upon at the rate of about 20,000 barrels per day. At the present time the Carter Co.'s own production is about 8,000 barrels per day.

According to Table 19 in the Statistical Exhibits (see p. 188), the Carter Oil Co. held 9,000,000 barrels in August, 20,000,000 barrels in October, and 19,000,000 barrels in December.

At the Commission's hearing in Washington on June 13, 1916, R. W. Stewart, a director in the Standard of Indiana, stated that his company purchased crude oil to the amount of about 4,000,000 barrels from various independent producers about September 15. Mr. Stewart stated that these unusually large purchases were made as a speculation for profit by rising crude-oil prices.

In the Commission's judgment, then, the general increase in stocks of crude oil held during 1915, while unusually large and partly responsible for the sharpness in the rise of prices, can be best explained as lawful speculation by various oil concerns on a rising market.

(B) COST OF MATERIALS.

The Commission's investigation, furthermore, makes it clear that refiners are entirely correct in stating that the operating costs of refining, assuming the same methods, increased during 1915. The cost of practically all the materials used in refining and treating petroleum and its products increased in much the same way that gasoline prices increased. Chief among such materials are sulphuric acid and caustic soda. The market price of the former advanced from between 0.85 cent and 1 cent to between 1.50 and 1.75 cents per pound, and of the latter from between 1.45 and 1.48 cents to between 5.25 and 5.50 cents per pound between January and December, 1915. The caustic soda, however, only advanced 1 cent after August. Litharge, another chemical sometimes used, also advanced in price during the year from 5 cents to 6.5 cents per pound, but between August and December the market fell 0.5 cent. Some refin-

eries use coal, and this fuel also rose in price, but even when fuel oil, coke, or other products were used, it is but fair to allow an increase in cost on the basis of increased market value of the material used. The market price of furnace coke f. o. b. Connellsville ovens exactly doubled between August and December, rising from $1.50 to $3 per ton. Nor is the advance in price of structural iron and steel tankage to be overlooked in connection with the operation of a refining company, and steel tank plates f. o. b. Pittsburgh rose from 1.25 cents per pound in August to 2.25 cents in December.

But when all has been said, and advances in price of materials of from 30 to nearly 300 per cent are recognized, it remains to be observed that the cost of materials other than crude oil is but a small fraction of the cost of making gasoline, and that the rise in price therein could affect the cost of gasoline only to the extent of a small fraction of a cent per gallon. Detailed cost accounts kept by several representative refineries have been examined, and these show that the acid cost per gallon of gasoline is from 0.03 to 0.04 cent. Similarly, the cost of caustic soda per gallon of gasoline runs from 0.002 cent to 0.005 cent. Other items are even more nearly infinitesimal in importance.

Obviously, the large item is the cost of the crude oil. Indeed, this single item at most large refineries was about 80 per cent of the total cost of gasoline in 1915.

(c) DETERIORATION IN QUALITY OF CRUDE.

Another important element that enters into the cost of refining and the supply of gasoline is the quality of the crude. It has been shown that the price of crude increased beginning with August, 1915. It is also true that the crude deteriorated in quality, one result being a decreased yield of gasoline per gallon of crude. Crude oil in storage deteriorates chiefly as a result of evaporation, the more volatile elements passing off. This, in the case of light crudes valuable for producing gasoline, is an important loss. In the latter part of 1915 and thereafter, not only was less Cushing crude produced, but that which was run to stills in refineries was more largely drawn from storage, and this meant a somewhat greater cost of securing a gallon of gasoline. The books of one refinery using Oklahoma crude show the following yields of crude naphtha—from which gasoline is derived—by quarters during 1915: 23.7 per cent, 22.2 per cent, 17.9 per cent, and 18.5 per cent.

Not only does crude oil deteriorate in storage, but also the quality produced from a given pool often declines. It is well known to the trade that Cushing crude oil at the outset yielded 30 per cent or more of gasoline by ordinary methods, while before the end of 1915 the

yield was often as low as 20 per cent. It is safe to say that there was a decline in Cushing crude of from 7 per cent to 10 per cent in gasoline content between 1913 and 1915.[1]

(D) LARGER SHARE OF EXPENSES BORNE BY GASOLINE.

GASOLINE BECOMES MAIN PRODUCT; OTHERS SOMETIMES BY-PRODUCTS.—The production of gasoline is necessarily joint production. As crude oil is made up of a complex group of elements, in the production of gasoline other products necessarily result. Gasoline and similar volatile oils, kerosene, lubricating oils, petrolatum, gas oil, fuel oil, paraffin or asphalt, tar, coke, and other products, may all be obtained from a barrel of crude, and gasoline can not be produced economically without also producing at least kerosene and fuel oil. The proportions of these various joint products may be varied considerably according to the refining methods adopted, and consequently the supply of any one of them is apt to be affected by the market for the others. Also, the allocation of the cost of production is partly dependent upon the relative demand and supply conditions affecting the several products.

In years past and prior to the development of motor cars and other vehicles and tractors using internal-combustion engines, kerosene was as a rule the most valuable of the joint products obtained from crude oil. The demand for it was greater than for other products. At that time most refiners were accustomed to regard kerosene as their main product and counted on it for their profits. Gasoline, lubricating oils, and fuel oils were by-products, for which the demand was less than for kerosene. If cost of production increased, the increase had to be covered largely by increasing kerosene prices.

To-day and for several years past the situation as between kerosene and gasoline products has been reversed and kerosene is now often a by-product. As the cost of crude oil has gone up the demand for kerosene has not been strong enough to enable refiners to shift any considerable part of their increased cost to the consumers of kerosene, while gasoline is so much in demand that it will stand large advances in price and has been made to do so.

Fuel oil stands in much the same position as kerosene, as the demand is strictly limited by the possibility of substituting coal. Moreover, fuel oil is largely sold on contracts running one or more years, and in such cases increased costs could not be met by advancing prices. As to lubricating oils, it is to be noted in the first place that much of the crude oil of the country does not yield a good product with economical means of production, owing either to the presence of certain impurities or to the absence of the essential

[1] Oil, Paint and Drug Reporter, Feb. 14, 1916.

viscous elements in the crude. In the second place, many refiners even though operating on suitable crudes, have lacked the capital necessary to enlarge their plants to include the manufacture of lubricants. In the third place, the sale of lubricating oils is to a considerable extent made on contracts specifying a fixed price, so that increased cost of crude could be immediately transferred to the price of lubricating oil only in part. And motor lubricating oils, furthermore, are generally sold to consumers as standardized, trade-marked articles in small quantities and at high rates of profit, with the result that prices are maintained at a nearly constant level. Those companies which reported the price of advertised brands of motor-lubricating oil show no variation in price during 1915. Thus the increased cost of the crude that goes into the production of lubricating oil has reduced the profit on such oils. This is partly out of real necessity, but partly, it would seem, as a result of the commercial policy of maintaining prices of brands.

It follows from the foregoing facts concerning the demand for the by-products yielded jointly with gasoline in the refining of crude oil that gasoline has of necessity borne the larger share of the increased cost of the crude and of such increase as there was in the expense of refining.

While the foregoing conditions exist, it is not true that no advances have been made in other refined products besides gasoline, nor that gasoline should take the whole increase in cost of crude. The demand for paraffin and lubricants has been good, and the prices of both fuel oil and kerosene have been raised somewhat since August, as the following tables show. The weakness of the demand for kerosene, and the handling of lubricating and fuel oil by contract have, after all, been the chief reasons why gasoline has had to bear a disproportionate share of the increased cost of production. In the analysis of costs taken up in the next chapter, however, the chief method used treats all products other than gasoline as by-products.

RELATIVE ADVANCES OF GASOLINE AND OTHER PETROLEUM PRODUCTS.—The facts as to the relative movements of the prices of the chief refined products of petroleum are set forth in the following tables. The prices are averages by months, and show the course of f. o. b. refinery prices as reported to the Commission.

TABLE 12.—MONTHLY AVERAGE POSTED PRICE OF PENNSYLVANIA CRUDE OIL AT THE WELLS AND MONTHLY AVERAGE EASTERN PRICES OF REFINED PRODUCTS (REFINERY PRICES), 1915.

[All figures in cents per gallon.]

Month.	Crude oil (posted price).	Gasoline.	Kerosene.	Fuel oil.	Lubricating oil.	Weighted average.[1]
January	3.57	9.05	4.05	2.18	12.13	7.46
February	3.57	9.07	4.01	2.16	12.33	7.49
March	3.45	8.32	3.97	2.13	12.21	7.28
April	3.21	8.10	3.95	2.14	11.79	7.10
May	3.21	8.39	3.77	2.19	11.75	7.09
June	3.21	8.87	3.72	2.19	11.80	7.19
July	3.21	9.13	3.69	2.21	12.08	7.32
August	3.50	9.63	3.73	2.24	12.33	7.52
September	3.90	11.26	4.15	2.45	12.28	8.04
October	4.17	12.46	4.40	2.78	12.78	8.57
November	4.57	13.15	4.67	3.91	13.20	8.99
December	5.05	14.54	4.89	3.31	13.21	9.41
Increase, July–December	1.84	5.41	1.20	1.10	1.13	2.09

[1] Weights used are the yield percentages based on reports from refiners of Appalachian crude as shown in Statistical Exhibits, Table 37, p. 218.

TABLE 13.—MONTHLY AVERAGE POSTED PRICE OF KANSAS-OKLAHOMA CRUDE OIL AT THE WELLS AND MONTHLY AVERAGE MID-CONTINENT PRICES OF REFINED PRODUCTS (REFINERY PRICES), 1915.

[All figures in cents per gallon.]

Month.	Crude oil (posted price).	Gasoline.	Kerosene.	Fuel oil.	Lubricating oil.	Weighted average.[1]
January	1.31	7.04	2.74	1.30	15.12	4.27
February	1.07	6.77	2.57	1.27	14.98	4.14
March	.95	6.50	2.45	1.20	15.09	4.02
April	.95	6.39	2.36	1.16	15.08	3.95
May	.95	6.45	2.32	1.14	15.16	3.96
June	.95	6.12	2.30	1.12	15.27	3.89
July	.95	6.16	2.33	1.11	15.46	3.92
August	1.50	6.50	2.42	1.20	15.33	4.04
September	1.86	7.58	2.77	1.38	15.48	4.47
October	1.90	8.96	3.09	1.47	15.65	4.92
November	2.14	10.41	3.30	1.62	16.12	5.40
December	2.67	12.08	3.95	1.79	16.11	6.01
Increase, July–December	1.72	5.92	1.62	.68	.65	2.09

[1] Weights used are the yield percentages.

The conclusion from these tables is that, while crude oil advanced considerably in price between July and December, 1915, the value of products of crude oil combined advanced considerably more; the major part of the advance being in gasoline.

Section 13. Minor factors affecting supply.

A number of minor factors affect the prices of gasoline products directly or indirectly through the price of crude oil. Though there is danger of exaggerating some of them by even mentioning them, taken together they are necessary to a complete understanding of the gasoline situation.

Taking up those that tended to increase crude prices, there are the destructive tank fires that occurred in northern Oklahoma during April, May, and June of 1915 and are reported to have consumed about 2,000,000 barrels. Also the intrusion of water in the oil-bearing sands of California in 1914 reduced production there, and the disturbed condition prevailing in Mexico hindered the development and operation of Mexican oil wells. The withdrawal of oil lands by the Government, notably in California, but also in Wyoming, probably held back production to some extent. This, however, may be for the best in the long run as a means of conserving the Nation's supply for naval and other purposes. In the Midway-Sunset field in California production appears to have decreased by some 10,000,000 barrels and the decrease is attributed largely to withdrawals. This crude, however, is not capable of yielding much gasoline.

In addition to the foregoing, more or less sporadic causes affecting the price of crude, the continuous waste of this important resource must be noted. At the wells gas has been allowed to escape though known to contain large quantities of gasoline. Field storage has been resorted to, with large loss through evaporation and deterioration of the crude.

Among the minor factors affecting gasoline prices directly may be mentioned the following: (1) The expense of marketing gasoline is normally greater in the winter months, chiefly for the reason that the volume of business is less and the overhead expenses being distributed over fewer gallons are greater per gallon. (2) Violent storms along the Gulf coast in the summer of 1915 did serious damage to refineries and somewhat decreased their output. (3) Importations of gasoline have been checked by the war. This affected the Pacific coast chiefly.

These minor factors have been mentioned here because they have been given some prominence in discussions in trade journals and because they are facts. But they can not be said to have affected materially the advance in price in 1915. In so far as Mexican and California and Gulf coast crudes are concerned, under present methods of refining they yield little gasoline and affect gasoline prices only indirectly. The wastes, moreover, have existed many years and are less gross than formerly, while the importation of gasoline is too small to have exerted much effect. In California, where

imports by the Shell Company of California[1] were checked, prices have been lower than elsewhere and have not risen more. The quantity and quality of oil involved in the land withdrawn by the government are open to question.

III. "DEMAND AND SUPPLY" AND THE ADVANCE IN GASOLINE PRICES.

In the preceding sections of this chapter the condition of the demand and the supply of gasoline in 1915 has been discussed in detail. The underlying factors, such as exports, sales of gasoline-using engines, and production of crude oil, have been analyzed, and it has been shown that these factors brought an increased demand for gasoline and an increased cost of the raw material from which gasoline is manufactured. The conclusion must follow that the average price of gasoline in 1915 was of necessity higher than in the year preceding; also that the price might be expected to be higher in the second half of the year than in the first half.

But these conclusions hardly touch the question as to whether the advance which took place occurred within the limits of time and in the degree that the demand and supply conditions reasonably warranted.

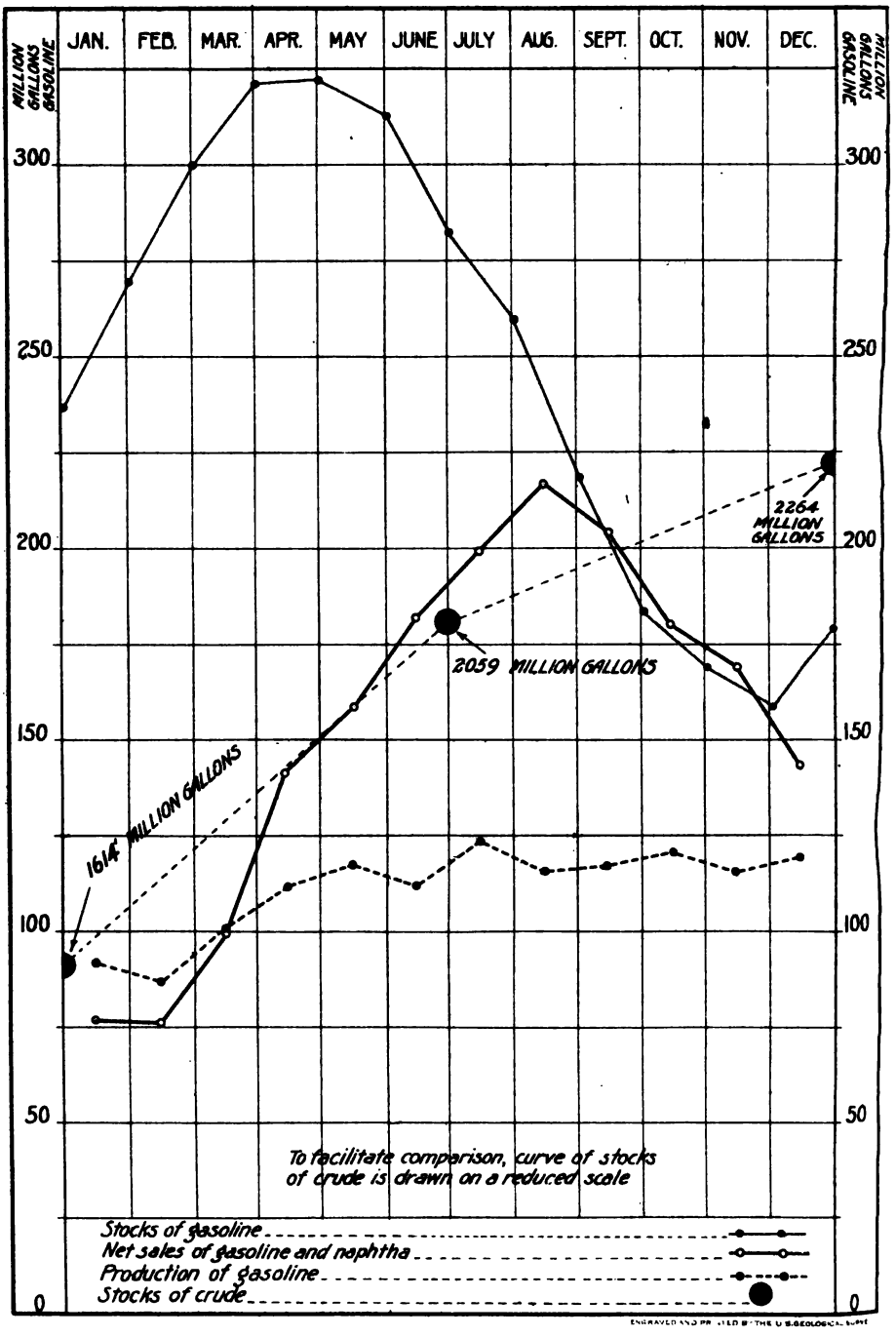
Exports, for example, played an important part; but exports began to decline in a rather marked degree at about the time prices first advanced—August, 1915—and they remained at a level that was considerably lower than that of the first half of the year throughout the period of advancing prices.

Again, the domestic demand as actually affecting the current market can be gauged or measured quantitatively only roughly, and that through quantity sold. Domestic sales, however, declined sharply after August. This decline was partly a reaction from the higher prices, but even as such would reduce consumption and retard an advance in price. Chiefly it was the normal seasonal decline in consumption due to the fact that automobiles, tractors, motor boats, gasoline stoves, and the like, are less and less used as winter approaches.

On the supply side of the gasoline market, the immediate factors must be the quantity of gasoline available for sale, or "in sight," and, more remotely, cost of production, which will be discussed later. The production of gasoline by refineries was maintained at a steady or slightly rising level from August on, while exports decreased. Stocks of crude at refineries and elsewhere increased. Stocks of gasoline decreased till December, when an increase began, a condition that appears to be normal in the industry.

[1] This company is affiliated with the Shell Transportation & Trading Co., in connection with which it has imported gasoline from the Dutch East Indies.

DIAGRAM 10. RELATIVE MOVEMENT OF STOCKS, SALES, AND PRODUCTION OF GASOLINE, AND STOCKS OF CRUDE OIL BY ALL COMPANIES REPORTING TO THE COMMISSION, 1915.



All these facts make it difficult to conclude that the entire advance in gasoline prices between August and December was required or is to be explained by the demand and supply conditions.

In order to bring these elements in the situation into relation with one another, the accompanying diagrams have been prepared.

Diagram No. 10 represents for all refining companies the relative movement of stocks, sales, and production of gasoline during 1915; and the increase in stocks of crude held by refiners is indicated. The line representing this last item is only determined by three points, January 1 and July 1, 1915, and January 1, 1916. The initial point in this curve is put at the point where production of gasoline begins, with the idea that refinery stocks of crude normally bear some relation to production of refined products. The other "curves" are determined by points representing each month. The curve of sales represents monthly "net sales," i. e., sales by refiners to jobbers and to consumers.

It will be observed that the production of gasoline increased up to July and remained fairly steady thereafter, the December production being about 27,600,000 gallons greater than that in January.

Stocks of crude held by refiners increased both absolutely and relatively to production of gasoline. Between July 1, 1915, and January 1, 1916, this increase was from 2,059,000,000 gallons to 2,264,000,000 gallons, or about 10 per cent.

Stocks of gasoline increased till May; fell sharply thereafter until December 1; then began an upward movement. This decrease in stocks was evidently due to the seasonal increase in sales. As the sales rose above the production, stocks were drawn upon.

The curve of sales by refiners began to rise in March, reached its maximum in August, and declined sharply between August and December.

An examination of these facts leads to the conclusion that on the basis of competitive demand and supply, and without regard to cost, (1) the price of gasoline would have begun to advance about June, as in that month stocks were decreasing rapidly while sales were increasing; (2) the price would have continued to advance until the early part of October for the reason that up to that time decreasing stocks, increasing sales, and stationary production were the rule; and (3) a decline would have followed in December as a result of rapidly decreasing sales, increasing stocks, and a refinery output that was maintained at a maximum. The export situation (see p. 32) supports this reasoning. On the other hand, anticipation of the heavy spring and summer demand usually causes an increase in stocks at this time of the year.

The reader must beware basing his conclusions on this part of the discussion alone. Some refiners have stated that the advance in

gasoline prices was caused by increased costs, and this aspect of the problem will be considered at another point in this report. Other refiners, however, have based the advance upon "demand and supply," and it is to ascertain the force of this latter explanation that the foregoing diagram is presented. In any case, the fact that prices advanced so unevenly in different sections is not explained.

Diagrams 11 and 12 indicate as nearly as possible the difference between the demand and supply conditions under which the various "Standard" refining companies and other refining companies operated, and require little discussion. Very concisely stated, the chief points of contrast are:

(1) The relatively large stocks of gasoline held by the group of "Standard" refining companies.

(2) The relatively late and slow decrease in stocks of gasoline held by "Standard" refiners.

(3) The relatively great increase in stocks of crude oil held by "Standard" refiners between July, 1915, and January, 1916, as compared with a decrease in the stocks held by other companies.

(4) The relatively great increase in sales of gasoline by "Standard" refiners up to August, 1915, and the subsequent rapid decrease in such sales.

It is noteworthy that the diagram for all companies is so similar to that for the Standard companies. This illustrates the relatively great part these companies, if regarded as a group, play in the gasoline business in this country.

DIAGRAM 11. RELATIVE MOVEMENT OF STOCKS, SALES, AND PRODUCTION OF GASOLINE, AND STOCKS OF CRUDE OIL; STANDARD COMPANIES, 1915.

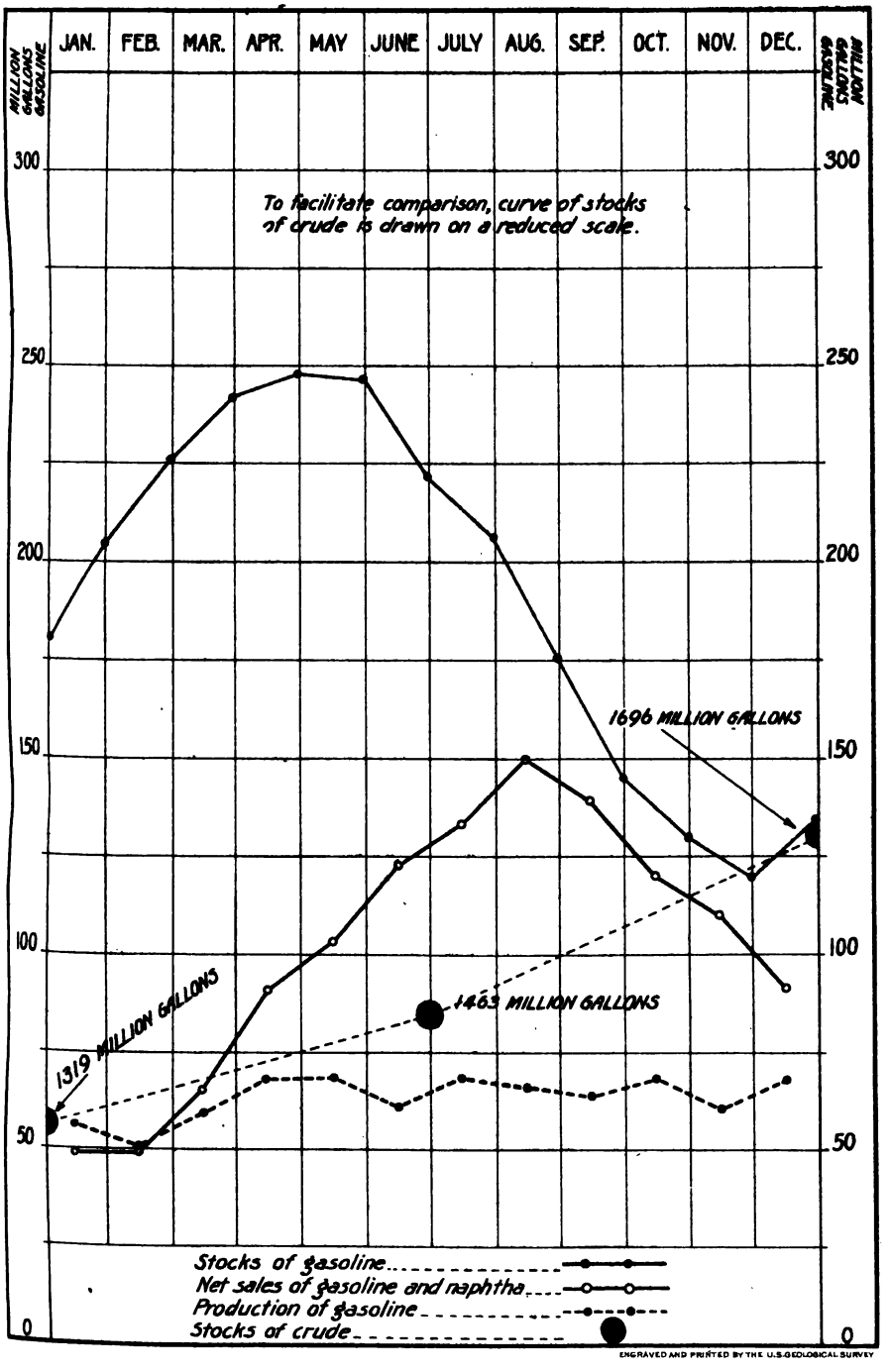


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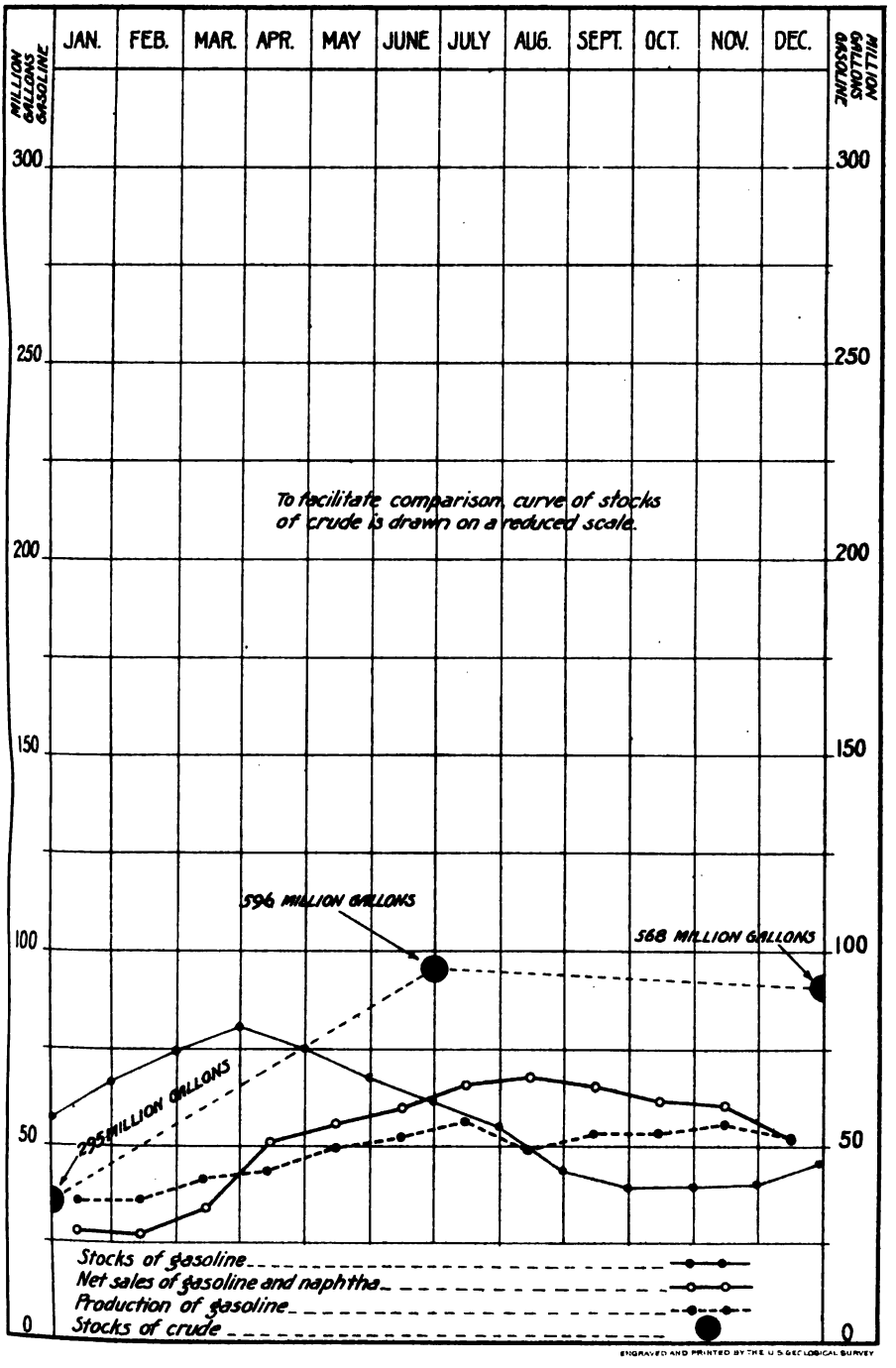
DIAGRAM 12. RELATIVE MOVEMENT OF STOCKS, SALES, AND PRODUCTION OF GASOLINE, AND STOCKS OF CRUDE OIL: OTHER COMPANIES, 1915.



CHAPTER III.

COSTS AND MARGINS.

Section 1. Introduction.

The foregoing discussion of the demand and the supply of gasoline conclusively demonstrates that a considerable rise in the price of gasoline was to have been expected in the latter part of 1915. It does not, however, demonstrate what the amount of this rise should have been. It throws little light on the question as to whether the exact rise that did occur was too little or too great. It is clear that a considerable part of the advance in gasoline prices was caused by normal and legitimate demand and supply conditions; but not that these conditions account for the whole advance.

Demand and supply conditions gave to holders of gasoline the opportunity to advance prices. This would have been the case to some extent even if there had been no large refining companies each in its own territory possessed of a dominant position in the industry, and allied through common stockholders with the chief oil purchasing and transporting agencies in the country. With such a situation existing, it would behoove dominant organizations to act with especial care and moderation, in order to guard against aggravating conditions.

The importance of the forces of demand and supply in respect to the price changes in the gasoline market in 1915 is to be given due recognition. Those forces, however, are complicated in their working and can hardly be measured with sufficient accuracy to furnish a basis for determining the reasonableness of any particular level of prices that may be established. Moreover, the justification of reasoning based upon demand and supply depends upon the existence of competition. And the assumption is that they tend to fix prices in a reasonable relation to cost.

At best, therefore, demand and supply can but give a general notion as to whether a rise in price is justified or not; and when reasonably competitive conditions do not exist, explanations of prices based on demand and supply are very unsatisfactory. In an industry such as the one now under examination, in which competition works but imperfectly, more reliance must be placed upon cost. The prices established must be compared with all the costs of the business. This is especially necessary in dealing with differences in prices established in different territories, among which there is virtually no competition in price.

Refiners, moreover, have urged that increased cost of production, and especially the increased cost of crude oil, has necessitated the advance in gasoline prices; and the relation of price to cost requires careful attention on this ground.

For these reasons there is set forth in the following pages a detailed comparison between the advance in prices and the advance in cost of production. Net earnings of the entire business are also examined for the purpose of learning whether or not they were unusually large.

To have secured complete cost data from all refiners would have been both impossible and unnecessary; some refiners have no complete cost data; and, above all, data from a limited number of representative refineries are sufficient, if the refineries are selected because of their representative character, size, location, and character of operations being considered. Detailed and complete costs, therefore, have been collected from 11 refineries operated by 10 companies.

In order to lay a broad foundation, however, reports were gathered from the great majority of the refiners in the United States, who manufacture all but a small fraction of the gasoline sold in this country, to show a comparison between the movement of the cost of the crude oil used, which is the principal element of cost, and the prices secured for the chief refined products obtained from such oil.

Section 2. Outline of the technical process of refining crude oil.

A brief description of refining processes is given in order to make clearer the facts stated concerning the cost of production. Numerous products are obtainable from crude oil by means of distillation, which breaks up the crude oil into products of different gravities. The lighter, or more volatile products, rise from the stills first, the heavier ones last, leaving a nonvolatile residuum. The method of treatment described below is that used by an eastern refining company in the distillation of Mid-Continent crude oil.

The distillation process.—The crude oil stills are charged and fires lighted underneath. When the temperature becomes sufficiently high, the crude oil begins to vaporize. The light, volatile substances are vaporized first; but as the temperature is raised heavier substances are vaporized also. As the vapor rises it is carried to condensers and the liquids resulting from condensation are run into tanks. The gravity of the liquid is watched, and after a certain point, the stream is "cut" into a different tank. The first product obtained is crude naphtha, or benzine. Next come "water white" kerosene distillate and "standard white" kerosene distillate. The only other important product of the first distillation is heavy tar distillate. After all the other products have been distilled off, the solid residue left in the still is coke.

Naphtha or gasoline.—In the case of the company whose method is here described, crude naphtha is obtained not only from the first distillation, but also from the standard white kerosene distillate, which is re-run. Some companies also obtain crude naphtha from heavier products by using "pressure stills," which are described on another page. The crude naphtha from whatever source obtained is run into agitators, where it is thoroughly mixed with sulphuric acid by means of an air blast. This process, which is called "treating," removes the impurities and coloring matter, and after settling, the "acid sludge" is drawn off. The oil remaining is washed with water and then treated with an alkali, such as caustic soda, to remove all traces of the acid. The acid sludge can also be treated, if desired, to recover the acid, and the oil which separates out is what is known as "acid oil." The next process in producing gasoline is heating the treated naphtha in steam stills in the presence of live steam. The resultant product is gasoline and finished naphtha of various gravities. The residue, known as naphtha bottoms, is considered the same as kerosene distillate.

Kerosene and fuel oil.—The kerosene distillate, both water white and standard white, like the crude naphtha, is run into agitators and treated with sulphuric acid and an alkali, such as caustic soda. "Refined oil," "illuminating oil," or kerosene is thus obtained without any further treatment. Some of the standard white distillate, however, as already indicated, is run into "reducing stills," where it is broken up into crude naphtha, kerosene distillate, and fuel oil. This company makes no distinction between "gas oil" and "fuel oil," although gas oil when produced is of a higher gravity than fuel oil and is used in the manufacture of gas rather than as a fuel.

Wax.—The treatment of the heavy tar distillate is more complex than the treatment of the crude naphtha and kerosene distillate, although it receives the same treatment in the agitators. This treated tar distillate then goes to the wax presses. Mr. F. C. Robinson, chief chemist of the Atlantic Refining Co., describes the process as follows:

> The first step is the process of cold pressing. The distillate is first cooled to 20° to 30° F. by pumping through pipes surrounded by cold brine, thereby causing the paraffin wax (amounting to about 10 per cent of the distillate) to solidify. This solid 10 per cent, mixed with the 90 per cent liquid oil, forms a soft mush which is pumped through a filter press. That which stays in the press is called the slack wax, and amounts to about 20 per cent of the paraffin distillate. The 80 per cent that goes through is called pressed distillate. The slack wax, consisting of about equal parts of oil and wax, is then put through a process, peculiar to the oil business, known as the sweating process. It consists of cooling the mixture until it has become a solid cake and then very gradually warming it. The crystals of the paraffin form a network, through which the oil is distributed, and when the mass is warmed the oil sweats out and drifts away. It always carries with it some wax in solution, but the final result is that the oil all sweats out, leaving the paraffin wax in a fairly pure state.

This sweating process separates the slack wax into crude paraffin wax and what is known as foots oil. The latter still contains much paraffin, which is removed by putting it again through either the cold-pressing or sweating process.

The crude paraffin wax is then filtered through clay (fuller's earth) to remove the coloring matter and thus a colorless refined wax is produced.

Lubricating oil.—Lubricating oils are made from the paraffin pressed distillate. This is run into "reducing stills" and there is obtained lubricating stock of various viscosities,[1] paraffin intermediate, and fuel oil. This lubricating stock is run into the agitators and treated like the crude naphtha and kerosene distillate, and various paraffin oils obtained. By another method of treatment the lubricating stock, which can be sold without further treatment, is filtered. The lighter oils (lower viscosities) thus obtained are spindle oils, while the heavier oils (higher viscosities) are cylinder oils.

Coke.—Coke is the residue left from the first distillation after all the lighter products have been distilled off. It is used largely for fuel, but it is also used in the manufacture of electric carbons.

PRESSURE STILLS.—The breaking up, or "cracking,"[2] of some of the heavier petroleum products, such as gas oil and fuel oil, is accomplished by distillation in pressure stills. By this process, which involves slow distillation with relatively high pressure and temperature, a considerable additional quantity of the valuable lighter products, such as crude naphtha and kerosene distillate, is obtained from products of comparatively little value. With the present scarcity and high price of gasoline, this process becomes highly important because of the largely increased quantity of gasoline obtained from a given quantity of crude oil as compared with the straight-run process alone. There are several varieties of pressure stills in use, the most successful so far being the Burton stills used by some of the Standard Oil companies.[3]

I. RELATIVE MOVEMENTS OF COST OF A GALLON OF CRUDE OIL AND OF THE VALUE OF THE REFINED PRODUCTS OF A GALLON OF CRUDE.

The foregoing analysis of the refining process indicates the variety of the products associated with gasoline and the intimate way in which they are interrelated. To a great extent the refined products obtained from crude oil are jointly produced, and, their prices being necessarily interdependent, a study of the prices

[1] Viscosity is measured by the time required for a given quantity of oil at a given temperature to flow through an orifice of given diameter.

[2] See p. 22.

[3] The Tide Water Oil Company also uses the Burton process. About 30 per cent of this company's stock is held by Standard-company stockholders.

and values of the whole group of products yielded by a given quantity of crude is of vital importance in an investigation of the price of gasoline. As already noted (p. 52), it might be that gasoline has commanded a high price because kerosene yielded by the crude used could not be sold at a profit. In this chapter, therefore, the facts concerning this question will be found by comparing the total value of the combined products yielded by a gallon of crude oil with the cost of that gallon of crude oil. It will be shown that, while kerosene, lubricating oil, and fuel oil did not advance as much as gasoline, their prices did rise appreciably.

Section 3. Relative movements of cost of crude oil and of its chief refined products, based on average refinery prices as reported to the Commission.

The first tables which follow (Tables 14–19) are of value chiefly as showing the relative movements during 1915 of the cost of crude and of the value of refined products. As, on the one hand, prices are not available in all cases for all the products, but only for from 90 to 95 per cent thereof, and, on the other hand, not all the costs of refining operations are included, but only about 80 per cent thereof comprised in the cost of the crude oil, absolute margins at given times can not be computed from these tables. Such large parts of the cost and of the value of products are covered, however, that the increases or decreases therein afford comparisons of considerable value.

The weighted average prices of refined products are obtained by attaching to the price of each product the weight warranted by the per cent of that product secured from a gallon of crude oil.[1] The "yield per cents" are simple averages of the actual yields secured by the refineries of the group embraced in each table. Under the head of "value of combined products" is shown a weighted average of the values of the various refined products. The values are weighted by their respective yield per cents, and the resulting average gives the figure that would be obtained if 100 per cent of the crude were turned into products and if all the products were embraced in the four columns shown. As part of the crude is lost, however, the value of the loss has to be deducted from the value of the combined products. Furthermore, the fractions of products for which values are shown in the table do not include all of the crude that is not lost. For example, the sum of the yield per cents in Table 14 is 88.08 per cent, and, as 5.7 per cent of the crude is lost, only 93.78 per cent of the crude is accounted for. The other 6.22 per cent represents products for which

[1] Thus, if price of gasoline were 12 cents and kerosene 10 cents, and the yield of gasoline were 22 per cent and of kerosene were 35 per cent, the weighted average would be found by multiplying 12 by 22 and 10 by 35, adding the products thus obtained and dividing by 57 (the sum of the yield per cents).

prices were not available (paraffin, greases, tar, coke, etc.). They are automatically included in the weighted average on the basis of the value of the other 88.08 per cent. To this extent the "value of combined products" is an estimate. In most cases the unknown element is so small as to be inappreciable.

The following group of tables shows the monthly average crude costs and prices of products for various refineries grouped according to kind of crude used and the location of the refinery. The figures are as reported by the refineries to the Commission and represent actual prices paid or received. The cost of crude shown below in Tables 14 to 19 is the cost of crude used which is not necessarily the current market price. Especially with respect to the costs shown in Table 14 there was a considerable period between the time of the purchase and the refining of the crude. At the bottom of each table are figures which show the increases or decreases in the monthly average cost of crude oil, value of each product, and margin between cost of crude oil and value of all products in some cases and of the chief products in others. The month taken as the basis for measuring such increases or decreases is naturally the one which lies nearest to the end of the downward movement and the beginning of the upward movement, and in some cases this is July, in others May, June or August, depending upon the kind of crude oil the refiners used and upon the market in which they sold their products. In all but one of the tables the dividing month is the one in which the crude-oil prices shown were the lowest; in Table 17, however, where the cost of crude shown for April is lower than that for July, the latter month is used for the reason that it corresponds to the movement of product prices and, from what is known of crude prices in general, the low April cost shown in the table is exceptional.

MIXED APPALACHIAN AND MID-CONTINENT CRUDE.—The first of these tables (Table 14) presents the averages for a group of four large eastern refineries, which operated on mixed crude oils, chiefly from the Oklahoma and Appalachian fields.

TABLE 14.—RELATIVE MOVEMENT OF THE MONTHLY AVERAGE COST OF A GALLON OF CRUDE OIL, AT THE REFINERY, AND OF THE AVERAGE PRICES OF THE CHIEF PRODUCTS OF A GALLON OF CRUDE OIL, AS COMPUTED FROM REPORTS OF REFINERS OF MIXED MID-CONTINENT (INCLUDING ILLINOIS AND APPALACHIAN) CRUDE TO THE COMMISSION, 1915.

[All figures in cents per gallon.]

Month.	Crude oil, cost.	Gasoline, 21.52 per cent.		Kerosene, 34.81 per cent.		Fuel oil, 20.91 per cent.		Lubricating, 10.84 per cent.		Value of combined products.	Loss, 5.70 per cent based on crude oil.	Value of products, loss deducted.	Margin between value of products and cost of crude oil.
		Price.	Value of gasoline fraction.	Price.	Value of kerosene fraction.	Price.	Value of fuel fraction.	Price.	Value of lubricating fraction.				
Jan.	4.12	9.04	1.95	5.01	1.74	2.56	0.54	15.36	1.67	6.70	0.23	6.47	2.35
Feb.	4.16	8.84	1.90	4.96	1.73	2.49	.52	15.55	1.69	6.63	.24	6.39	2.23
Mar.	4.01	8.78	1.89	4.90	1.71	2.53	.53	15.59	1.69	6.61	.23	6.38	2.37
Apr.	3.88	8.43	1.81	4.74	1.65	2.53	.53	15.19	1.65	6.40	.22	6.18	2.30
May.	3.87	8.67	1.87	4.76	1.66	2.52	.53	15.64	1.70	6.54	.22	6.32	2.45
June.	3.89	8.64	1.86	4.72	1.64	2.56	.54	16.07	1.74	6.56	.22	6.34	2.45
July.	3.90	8.75	1.88	4.74	1.65	2.64	.55	16.10	1.75	6.62	.22	6.40	2.50
Aug.	3.91	9.61	2.07	4.63	1.61	2.68	.56	16.33	1.77	6.82	.22	6.60	2.69
Sept.	4.18	10.86	2.34	4.72	1.64	3.03	.63	16.32	1.77	7.24	.24	7.00	2.82
Oct.	4.32	11.01	2.56	4.78	1.66	3.22	.67	15.94	1.73	7.52	.25	7.27	2.94
Nov.	4.82	13.13	2.83	4.96	1.73	3.39	.71	15.70	1.71	7.92	.27	7.65	2.83
Dec.	4.93	14.91	3.21	5.33	1.86	3.49	.73	16.05	1.74	8.56	.28	8.28	3.35
Increase or decrease: Jan.-May.	−.25	−.37	−.08	−.25	−.08	−.04	−.01	.28	.03	−.16	−.01	−.15	.10
May-Dec.	1.06	6.24	1.34	.57	.20	.97	.20	.41	.04	2.02	.06	1.96	.90

The products included in Table 14 embrace 88.08 per cent of a gallon of crude oil, or over 93 per cent of the total, if 5.7 per cent of loss is included. The table shows that the margin between the value of 94[1] per cent of all the products of a gallon of crude oil and the cost of the gallon of crude increased during the year from 2.35 cents in January to 3.35 cents in December. The fraction of each product secured from the gallon of crude more than paid its pro rata share of the crude cost, with the exception of fuel oil. The weighted average value of the 94 per cent of products yielded, decreased only 0.15 cent between January and May, while the crude cost decreased 0.25 cent; and the May margin was consequently a trifle greater than the January one. Between May and December, moreover, while a gallon of crude oil advanced 1.06 cents, 94 per cent of the products thereof advanced 1.96 cents, making a further gain in margin of 0.90 cent. The advance in lubricating oil during the first period and that of gasoline in the second period are noteworthy. The advance between May and December in the gasoline fraction alone (1.34 cents) more than covered the advance in crude.

[1] As loss is 5.7 per cent, all products equal 94.3 per cent; and 88.08 is 93.4 per cent of 94.3.

APPALACHIAN CRUDES.—Table 15 is based on the yields of seven refineries using Appalachian crudes to the extent of over 95 per cent.

TABLE 15.—RELATIVE MOVEMENT OF THE MONTHLY AVERAGE COST OF A GALLON OF CRUDE OIL AND OF THE AVERAGE PRICES OF THE CHIEF PRODUCTS OF A GALLON OF CRUDE OIL, AS COMPUTED FROM REPORTS OF REFINERS OF APPALACHIAN CRUDE TO THE COMMISSION, 1915.

[All figures in cents per gallon.]

Month.	Crude oil, cost.	Gasoline, 20.28 per cent.		Kerosene, 34.87 per cent.		Fuel oil, 9.41 per cent.		Lubricating, 28.98 per cent.		Value of combined products.	Loss, 4.90 per cent, based on crude oil.	Value of products, loss deducted.	Margin between value of products and cost of crude oil.
		Price.	Value of gasoline fraction.	Price.	Value of kerosene fraction.	Price.	Value of fuel fraction.	Price.	Value of lubricating fraction.				
1915.													
Jan.....	4.20	9.05	1.84	4.05	1.41	2.18	0.21	12.13	3.52	7.46	0.21	7.25	3.05
Feb.....	4.22	9.07	1.84	4.01	1.40	2.16	.20	12.33	3.57	7.49	.21	7.28	3.06
Mar.....	4.12	8.32	1.69	3.97	1.38	2.13	.20	12.21	3.54	7.28	.20	7.08	2.96
Apr.....	3.89	8.10	1.64	3.95	1.38	2.14	.20	11.79	3.42	7.10	.19	6.91	3.02
May.....	3.87	8.39	1.70	3.77	1.31	2.19	.21	11.75	3.41	7.09	.19	6.90	3.03
June.....	3.86	8.87	1.80	3.72	1.30	2.19	.21	11.80	3.42	7.19	.19	7.00	3.14
July.....	3.91	9.13	1.85	3.69	1.29	2.21	.21	12.08	3.50	7.32	.19	7.13	3.22
Aug.....	4.16	9.63	1.95	3.73	1.30	2.24	.21	12.33	3.57	7.52	.20	7.32	3.16
Sept.....	4.58	11.26	2.28	4.15	1.45	2.45	.23	12.28	3.56	8.04	.22	7.82	3.24
Oct.....	4.87	12.46	2.53	4.40	1.53	2.78	.26	12.78	3.70	8.57	.24	8.33	3.46
Nov.....	5.25	13.15	2.67	4.67	1.63	3.01	.28	13.20	3.83	8.99	.26	8.73	3.48
Dec.....	5.77	14.54	2.95	4.89	1.71	3.31	.31	13.21	3.83	9.41	.28	9.13	3.36
Increase or decrease: Jan.–June.	— .34	— .18	— .04	—.33	— .11	.01	.00	— .33	— .10	— .27	— .02	— .25	.09
June–Dec..	1.91	5.67	1.15	1.17	.41	1.12	.10	1.41	.41	2.22	.09	2.13	.22

It will be observed that the average cost of crude was slightly greater than that shown in the preceding table, and that while the yield of fuel oil was less, that of lubricating oil was greater. The average gasoline fraction was slightly less.

It appears from this table, which includes 98 per cent of all products, that the margin between the cost of a gallon of crude and the value of the products secured therefrom was slightly higher than in the preceding case, but it shows a smaller increase, the figures for January being 3.05 cents per gallon, and for December 3.36 cents per gallon. In the case of the refiners using pure Appalachian crude, neither the fuel-oil nor the kerosene fraction appears to have borne its pro rata share of the average cost of crude. Gasoline and lubricating oils, however, more than made good the deficiency.

The turning point in prices for the Appalachian refiners appears to have come in June. The weighted average value of 98 per cent of the refined products of a gallon of crude fell only 0.25 cent between January and June, while the cost of crude fell 0.34 cent, with a re-

sulting small increase in margin. Between June and December, the weighted average value of products increased by 2.13 cents; crude oil increased by 1.91 cents; the margin, therefore, increased by 0.22 cent. In this case, the advance in value of the gasoline fraction did not cover the advance in cost of crude, but the advances in kerosene and lubricating oils in addition more than sufficed.

MID-CONTINENT CRUDE.—The following table (Table 16) is based on average f. o. b. refinery prices of seven refiners using practically nothing but Mid-Continent crude and all producing lubricating oils. Four of these are large Standard refiners and three are medium-sized other companies.

TABLE 16.—RELATIVE MOVEMENT OF THE MONTHLY AVERAGE COST OF A GALLON OF CRUDE OIL AT THE REFINERY, AND OF THE AVERAGE PRICES OF THE CHIEF PRODUCTS OF A GALLON OF CRUDE OIL, AS COMPUTED FROM REPORTS OF REFINERS OF MID-CONTINENT CRUDE TO THE COMMISSION, 1915.

[All figures in cents per gallon.]

Month.	Crude oil, cost.	Gasoline 21.05 per cent.		Kerosene 25.46 per cent.		Fuel oil 34.52 per cent.		Lubricating 9.37 per cent.		Value of combined products.	Loss 5.81 per cent, based on crude oil.	Value of products, loss deducted.	Margin between value of products and cost of crude oil.
		Price.	Value of gasoline fraction.	Price.	Value of kerosene fraction.	Price.	Value of fuel fraction.	Price.	Value of lubricating fraction.				
Jan.....	2.31	7.56	1.59	3.46	0.88	1.72	0.59	13.53	1.27	4.79	0.13	4.66	2.35
Feb....	2.14	7.72	1.63	3.26	.83	1.72	.59	13.32	1.25	4.76	.12	4.64	2.50
Mar....	2.07	7.05	1.48	3.22	.82	1.66	.57	13.49	1.26	4.57	.12	4.45	2.38
Apr....	2.01	6.87	1.45	3.17	.81	1.61	.56	13.47	1.26	4.51	.12	4.39	2.38
May....	1.92	6.94	1.46	3.21	.82	1.59	.55	13.59	1.27	4.54	.11	4.43	2.51
June....	1.91	6.66	1.40	3.16	.80	1.55	.54	13.74	1.29	4.46	.11	4.35	2.44
July....	1.86	6.96	1.47	3.14	.80	1.51	.52	14.02	1.31	4.54	.11	4.43	2.57
Aug....	2.08	7.08	1.49	3.08	.78	1.54	.53	13.86	1.30	4.54	.12	4 42	2.34
Sept....	2.40	8.18	1.72	3.34	.85	1.65	.57	14.07	1.32	4.93	.14	4.79	2.39
Oct....	2.55	9.13	1.92	3.71	.94	1.77	.61	14.31	1.34	5.32	.15	5.17	2.62
Nov....	2.73	10.77	2.27	3.85	.98	1.93	.67	14.70	1.38	5.86	.16	5.70	2.97
Dec....	3.14	12.41	2.61	4.70	1.20	2.12	.73	14.63	1.37	6.54	.18	6.36	3.22
Increase or decrease: Jan.-July..	−.45	−.60	−.12	−.32	−.08	−.21	−.07	.49	.04	− .25	−.02	−.23	.22
July-Dec..	1.28	5.45	1.14	1.56	.40	.61	.21	.61	.06	2.00	.07	1.93	.65

The average gasoline yield of the group was 21 per cent; kerosene, 25 per cent; and fuel oil, 35 per cent. The table covers 96 per cent of the refined products. The yield of fuel oil is relatively low. As a large number of small Mid-Continent refiners made no lubricating oils and consequently had more fuel oil left, the fuel-oil average for the average Mid-Continent refiners would be about 42 per cent.

These refineries using pure Mid-Continent crudes in 1915, showed a margin between cost of crude per gallon and value of 96 per cent of the products from a gallon of crude, of 2.35 cents in January; 2.34 cents in August; and 3.22 cents in December; a large margin and one that increased considerably during the year. Between January and July, their crude cost per gallon was reduced by 0.45 cent; and, as the average value of 96 per cent of the products of a gallon of crude only decreased 0.23 cent, their margin was greater in July than in January. While crude fell 0.45 cent, the gasoline fraction only fell 0.12 cent, and lubricating oil increased in value.

Most noteworthy is the fact that while their crude advanced 1.28 cents per gallon, July to December, the refined products of a gallon advanced 1.93 cents, allowing for loss. The advance in the value of the gasoline fraction alone nearly equalled the advance in a gallon of crude.

CUSHING CRUDE.—Especial interest attaches to the operations of a group of Mid-Continent refiners who operated entirely upon the rich crude from the celebrated Cushing pool. Table 17 is based upon the yields of four such refineries. Their yield per cents, including loss, total 100, as they were "skimming plants" producing no lubricating oils or products other than gasoline, kerosene, and fuel oil. The large percentage of gasoline secured (28.3 per cent) is notable.

TABLE 17.—RELATIVE MOVEMENT OF THE MONTHLY AVERAGE COST OF A GALLON OF CRUDE OIL AT THE REFINERY, AND OF THE AVERAGE PRICES OF THE CHIEF PRODUCTS OF A GALLON OF CRUDE OIL, AS COMPUTED FROM REPORTS OF REFINERS OF CUSHING CRUDE ("SKIMMING PLANTS") TO THE COMMISSION, 1915.

[All figures in cents per gallon.]

Month.	Crude oil, cost.	Gasoline, 28.27 per cent.		Kerosene, 24 per cent.		Fuel oil, 43.89 per cent.		Value of combined products.	Loss, 3.84 per cent based on crude oil.	Value of products, loss deducted.	Margin between value of products and cost of crude oil.
		Price.	Value of gasoline fraction.	Price.	Value of kerosene fraction.	Price.	Value of fuel fraction.				
1915.											
January	1.38	6.79	1.92	2.25	0.54	0.95	0.42	3.00	0.05	2.95	1.57
February	1.28	6.38	1.80	2.19	.53	.86	.38	2.82	.05	2.77	1.49
March	1.15	6.20	1.75	2.03	.49	.82	.36	2.70	.04	2.66	1.51
April	1.11	5.97	1.69	1.89	.45	.81	.36	2.60	.04	2.56	1.45
May	1.13	6.24	1.76	1.79	.43	.79	.35	2.64	.04	2.60	1.47
June	1.16	5.59	1.58	1.81	.43	.79	.35	2.45	.04	2.41	1.25
July	1.13	5.50	1.55	1.86	.45	.77	.34	2.43	.04	2.39	1.26
August	1.59	6.91	1.95	1.77	.42	.87	.38	2.86	.06	2.80	1.21
September	2.00	6.88	1.94	2.00	.48	1.08	.47	3.01	.08	2.93	.93
October	2.18	8.65	2.45	2.31	.55	1.22	.54	3.68	.08	3.60	1.42
November	2.66	10.19	2.88	2.60	.62	1.36	.60	4.26	.10	4.16	1.50
December	3.31	12.06	3.41	3.26	.78	1.54	.68	5.06	.13	4.93	1.62
Increase or decrease:											
Jan.-July	− .25	−1.29	− .37	− .39	− .09	− .18	− .08	− .57	− .01	− .56	− .31
July-Dec	2.18	6.56	1.86	1.40	− .33	.77	.34	2.63	.09	2.54	.36

In the case of these refiners the margin between crude oil and products was not only very small, but it was little more at the end than at the beginning of 1915. The figures were as follows: January, 1.57 cents; July, 1.26 cents; December, 1.62 cents. This exceptional situation was chiefly due, on the one hand, to the great rise in Cushing crude, and, on the other hand, to the large percentage of fuel oil, which neither covered its share of the average crude cost nor rose in proportion to crude prices. Also, the kerosene fraction did not increase in value in proportion to the advance in Cushing crude oil. Other elements in the situation were the absence of lubricating oil and the relatively low price of gasoline in the territory to which their sales were largely confined by freight rates.

Going more into detail, the figures for the Cushing refiners show that between January and July crude oil decreased 0.25 cent per gallon; value of products from a gallon of crude decreased 0.56 cent; and, as a result, the margin between the two decreased 0.31 cent. This was chiefly due to the large decline in the gasoline prices received by these refiners, and is to be remembered in connection with the subsequent discussion of the situation in Standard of Indiana territory, where most of their gasoline was sold. (See p. 124.)

Between July and December the situation of these refiners was somewhat improved; for, while their crude advanced 2.18 cents per gallon, the products secured per gallon advanced 2.54 cents, an increase in margin of 0.36 cent. This was a relatively small improvement, however; and it does not show the fact that in September some of those refiners made little, if any, margin. The average margin between the cost of a gallon of crude and the value of the products secured therefrom fell from 1.26 cents in July, to 1.21 cents in August, to 0.93 cent in September; but rose thereafter, as already stated, to 1.62 cents in December. These facts bear out the conclusions reached later in discussing the price reductions in Indiana territory. (See p. 127.)

CALIFORNIA CRUDE.—On the basis of the yield of four companies using California crude, the averages for which are shown in Table 18, the relative movements of prices of crude oil and refined products can be studied. The low cost of the crude, the low yield of gasoline, and the high percentage of fuel oil are notable features. The yields shown cover practically 100 per cent of the products.

TABLE 18.—RELATIVE MOVEMENT OF THE MONTHLY AVERAGE COST OF A GALLON OF CRUDE OIL AT THE REFINERY, AND OF THE AVERAGE PRICES OF THE CHIEF PRODUCTS OF A GALLON OF CRUDE OIL, AS COMPUTED FROM REPORTS OF REFINERS OF CALIFORNIA CRUDE TO THE COMMISSION, 1915.

[All figures in cents per gallon.]

Month.	Crude oil, cost.	Gasoline, 8.68 per cent.		Kerosene, 8.99 per cent.		Fuel oil, 74.64 per cent.		Lubricating, 1.28 per cent.		Value of combined products.	Loss, 6.17 per cent, based on crude oil.	Value of products, loss deducted.	Margin between value of products and cost of crude oil.
		Price.	Value of gasoline fraction.	Price.	Value of kerosene fraction.	Price.	Value of fuel fraction.	Price.	Value of lubricating fraction.				
1915.													
January...	1.68	7.34	0.64	7.75	0.70	1.45	1.08	32.00	0.41	3.02	0.10	2.92	1.24
February..	1.72	6.77	.59	7.75	.70	1.42	1.06	32.00	.41	2.95	.11	2.84	1.12
March.....	1.66	7.23	.63	7.75	.70	1.41	1.05	32.00	.41	2.98	.10	2.88	1.22
April.....	1.67	7.30	.63	7.75	.70	1.41	1.05	32.00	.41	2.98	.10	2.88	1.21
May.....	1.61	7.12	.62	7.75	.70	1.37	1.02	32.00	.41	2.94	.10	2.84	1.23
June.....	1.59	7.17	.62	7.75	.70	1.37	1.02	32.00	.41	2.94	.10	2.84	1.25
July.....	1.55	7.11	.62	7.75	.70	1.37	1.02	32.00	.41	2.94	.10	2.84	1.29
August....	1.50	6.78	.59	7.75	.70	1.37	1.02	32.00	.41	2.91	.09	2.82	1.32
September.	1.58	7.03	.61	7.75	.70	1.37	1.02	32.00	.41	2.93	.10	2.83	1.25
October...	1.61	8.69	.75	7.75	.70	1.40	1.04	32.00	.41	3.10	.10	3.00	1.39
November.	1.63	9.22	.80	7.75	.70	1.46	1.09	32.00	.41	3.21	.10	3.11	1.48
December.	1.68	9.47	.82	7.75	.70	1.53	1.14	32.00	.41	3.28	.10	3.18	1.50
Increase or decrease:													
Jan.-Aug..	—.18	—.56	—.05	.00	.00	—.08	—.06	.00	.00	—.11	—.01	—.10	.08
Aug.-Dec.	.18	2.69	.23	.00	.00	.16	.12	.00	.00	.37	.01	.36	.18

As the turning point in prices on the Pacific coast came in August, comparisons have been made with that month as the basis. The margin between crude and products, though small, increased during the year from 1.24 cents to 1.50 cents. Between January and August the average cost of California crude fell 0.18 cent per gallon; the products of a gallon of crude fell only 0.10 cent; consequently the margin increased very slightly. The steadiness of kerosene prices and the smallness of the decline in gasoline prices explain this fact. Between August and December there was a further slight increase in margin, as crude advanced 0.18 cent per gallon and products advanced 0.36 cent, a gain of 0.18 cent. The rise in the value of the gasoline fraction alone was sufficient to cover the advance in crude prices.

MIXED MID-CONTINENT AND GULF COAST CRUDE.—The companies embraced in Table 19 used about 25 per cent of Gulf coast crude oils. They secured about 12 per cent of gasoline—chiefly from the Mid-Continent crude which they ran—and 64 per cent of fuel oil. The yield of lubricating oil during 1915 was very small. About 97 per cent of the refined products are accounted for in the table.

TABLE 19.—RELATIVE MOVEMENT OF THE MONTHLY AVERAGE COST OF A GALLON OF CRUDE OIL AT THE REFINERY, AND OF THE AVERAGE PRICES OF THE CHIEF PRODUCTS OF A GALLON OF CRUDE OIL, AS COMPUTED FROM REPORTS OF MIXED MID-CONTINENT AND GULF COAST CRUDE REFINERS TO THE COMMISSION, 1915.

[All figures in cents per gallon.]

Month.	Crude oil, cost.	Gasoline, 12.07 per cent.		Kerosene, 15.58 per cent.		Fuel oil, 64.06 per cent.		Lubricating, 1.79 per cent.		Value of combined products.	Loss, 3.37 per cent, based on crude oil.	Value of products, loss deducted.	Margin between value of products and cost of crude oil.
		Price.	Value of gasoline fraction.	Price.	Value of kerosene fraction.	Price.	Value of fuel fraction.	Price.	Value of lubricating fraction.				
Jan.	2.40	8.18	0.99	3.11	0.48	1.95	1.25	26.37	0.47	3.41	0.08	3.33	0.93
Feb.	2.18	8.04	.97	2.91	.45	1.95	1.25	26.37	.47	3.36	.07	3.29	1.11
Mar.	2.09	7.97	.96	3.34	.52	1.90	1.22	26.37	.47	3.39	.07	3.32	1.23
Apr.	2.10	7.50	.91	2.79	.43	1.84	1.18	26.37	.47	3.20	.07	3.13	1.03
May.	2.04	7.47	.90	3.73	.58	1.76	1.13	26.37	.47	3.29	.07	3.22	1.18
June.	1.99	7.57	.91	2.78	.43	1.72	1.10	26.37	.47	3.11	.07	3.04	1.05
July.	1.97	8.14	.98	2.88	.45	1.71	1.10	30.68	.55	3.29	.07	3.22	1.25
Aug.	2.25	8.42	1.02	2.92	.45	1.66	1.06	30.68	.55	3.29	.08	3.21	.96
Sept.	2.19	8.95	1.08	3.27	.51	1.60	1.02	30.68	.55	3.38	.07	3.31	1.12
Oct.	2.58	10.88	1.31	3.37	.53	1.73	1.11	28.59	.51	3.70	.09	3.61	1.03
Nov.	2.71	11.45	1.38	3.60	.56	1.67	1.07	28.59	.51	3.76	.09	3.67	.96
Dec.	2.89	11.69	1.41	3.70	.58	1.67	1.07	28.59	.51	3.82	.10	3.72	.83
Increase or decrease:													
Jan.–July.	−.43	−.04	−.01	−.23	−.03	−.24	−.15	4.31	.08	−.12	−.01	−.11	.32
July–Dec.	.92	3.55	.43	.82	.13	−.04	−.03	−2.09	−.04	.53	.03	.50	−.42

In the case of certain of the refining groups discussed thus far, margins made in 1915 were sometimes low, but for other crudes in no case has a loss been indicated, or a December margin that was lower than the mid-year margin. The average of the returns for the two big Gulf Coast refiners (The Texas Co. and the Gulf Refining Co.), however, indicates the existence of both of these exceptional conditions.

Between January and July conditions appear to have favored these Gulf Coast refiners, as the decrease in their cost of crude oil was 0.43 cent per gallon as compared with a decrease in value of 97 per cent of the products of only 0.32 cent. The margin between the cost of a gallon of crude and the value of 97 per cent of its products was 0.93 cent in January and 1.05 cents in June. But thereafter crude rose faster than products, so that the margin was only 0.83 cent in December. Between July and December crude rose 0.92 cent; but products rose only 0.50 cent; and the margin decreased 0.42 cent per gallon of crude refined. Thus the margin was very low, and was lower at the end of the year than at any other time. This conclusion bears out the statements of representatives of the companies concerned that, as refiners, they made little, if any, profits in 1915. The chief reasons

for this fact lie (1) in the small yield of gasoline secured on account of the character of crude; (2) in the failure of their refinery price of gasoline to advance in proportion to their crude costs; and (3) in the low prices received for their large volume of fuel oil.

The operations of these interests as a whole, however, including pipe lines, crude-oil production, and marketing, were profitable, the distribution of profit between the various departments being more or less arbitrary.

GENERAL CONCLUSION CONCERNING RELATIVE ADVANCES OF CRUDE OIL AND REFINED PRODUCTS.—From this examination of the relative advances in prices of crude oil and of refined products, it appears that, in general, during the first half of 1915 the price of products fell less than the price of crude; while during the last half products advanced more than crude. The net result was a considerable advance in margins. The smaller Mid-Continent refiners using nothing but Cushing crude, however, and the Gulf Coast refiners were less prosperous. In the case of the former, the effect of the low prices in Standard of Indiana territory is to be seen. It is probable, too, that although they had the advantage of cheap crude they would have been better off if they had been in a position to use more complete refining methods. (See p. 24.) The largest margins appear to have been made by the big eastern refineries using Mid-Continent crude to an important extent. The advance in the value of the gasoline yields secured by these refiners taken alone was more than enough to cover the advance in cost of crude. They also had relatively low yields of fuel oil, which was not a profitable product; and high yields of lubricating oil.

The preceding tables explain why it is that, while the *percentage* of advance in gasoline prices was not as great as the percentage of advance in the market price of crude, the refiners' margins increased. In the first place, it is the absolute increase in cents per gallon that counts. The per cent of increase varies with the amount of the base figure—which was larger in the case of a gallon of gasoline than in the case of a gallon of crude oil. In the second place, crude oil cost is only a part of the total cost. In the third place, the cost of crude to the refiners was partly a transportation cost and this part of their costs did not increase. In the fourth place, there were advances in other products besides gasoline. There was an absolute advance in the value of all products combined which was greater than the advance in the price of crude. Consequently the margin between crude and products increased.[1]

[1] A comparison of current market quotations of crude oil and the products thereof corroborates the results reached above in the comparison of actual prices paid and received. Comparisons based on market quotations are presented in the Statistical Exhibits, Tables 37 and 38, pp. 218 and 219.

II. COMPLETE COSTS FROM THE BOOKS OF REPRESENTATIVE REFINERS.

The foregoing cost data are very general in character in that they are based upon reports by the various companies on their total operations; they are averages of these reports, and the yield percentages used for the various refined products are the average for the year. In order to get the most accurate information obtainable, the Commission secured detailed data direct from the books of 10 companies selected for their representative character.

Section 4. Methods of computing gasoline costs.

Chiefly on account of the interrelation of refining processes and the products secured thereby, no entirely satisfactory cost figures can be secured for any single petroleum product. Refiners compute arbitrary costs for various products, but state that the figures are not used by them even in fixing their minimum prices. None of the refineries examined appears to have computed any but average costs for all products, and it is therefore difficult to find a completely satisfactory basis. Their prices appear to be generally made with reference to the demand and supply for each product, and the product that will bear it, is treated as though charged with a larger share of their total costs. This is in accordance with the well-known principle of charging what the traffic will bear—that is, making a profit on products which are in good demand and selling the by-products for what they will bring—and is only in an indirect way related to cost.

While, therefore, the exact cost of gasoline can not be determined, the average specific cost and a figure indicating how much of cost gasoline can bear, can be computed, and this has been done by the Commission. The former may be regarded as a minimum cost of gasoline, the latter as a maximum. Strictly speaking, the latter can not be used to show the cost of producing gasoline, as has been urged by some refiners, but may be taken to indicate the maximum share of total cost of refining crude oil that business policy may properly make it expedient to charge to gasoline under some circumstances. It is a method of figuring all the profits of the business on the basis of gasoline, other products being treated as mere by-products incidental to the manufacture of gasoline.

Such a "by-products method" of figuring the cost of gasoline is based upon the assumption that gasoline is the main product and others mere by-products. Gasoline is with some refiners not the main product, and with others is not the only product that yields a profit over specific cost.

In view of the difficulties of the subject, the Commission has used both of the two methods of computing the costs of gasoline which are mentioned in the preceding paragraphs. The first method may be called that of average specific cost.

METHOD OF COMPUTING AVERAGE SPECIFIC COST.—This method undertakes to show the cost of producing each principal product separately, the costs of all the products of any particular refinery operation, including general expenses, being computed on the same basis. To be more specific, the average cost per gallon of all the products of the crude oil stills (such as crude naphtha, kerosene distillate, tar distillate, fuel oil, and coke) is obtained and this cost per gallon is taken as the cost of the crude naphtha. Some companies, however, obtain crude naphtha from other refinery operations—from pressure stills, as in the case of various Standard companies, or from standard white distillate, as in the case of Company A. The cost of the crude naphtha from such additional sources is obtained by taking the average cost per gallon of all the products of the crude stills as the cost of the material (the fuel oil, gas oil, etc., treated in pressure stills, or the standard white distillate, treated in reducing stills) charged into the pressure or reducing stills, and then adding the operating costs. The cost per gallon is computed, and the cost thus obtained is taken as the cost of the crude naphtha. The cost of all crude naphtha combined, from whatever refinery operation produced, is obtained by multiplying the respective quantities of naphtha secured from the respective operations by the respective costs per gallon and adding the results. The average cost per gallon of all crude naphtha may then be computed, and the cost thus obtained is multiplied by the quantity of crude naphtha treated and the treating costs added, which gives the total cost of treated naphtha. The average cost per gallon is then computed; and the cost thus obtained is multiplied by the quantity of treated naphtha finished and the finishing costs added, which gives the total cost of finished naphtha, or gasoline. The average cost per gallon of gasoline is then computed.

This method assumes that a specific cost per gallon can be computed. But it further assumes that, gallon for gallon, each product is chargeable with a pro rata share of the cost of crude oil and crude still costs; also that the costs of each process subsequent to distillation in the crude stills are chargeable on a gallonage basis to all the products of the process. It may therefore be called the method of average specific costs.

METHOD OF JOINT-PRODUCTION, OR BY-PRODUCT COST.—It was repeatedly urged upon the Commission by various refiners that it is not possible to compute a specific cost of gasoline and that inasmuch as some products from crude, such as fuel oil, are often necessarily sold at less than an equal quantity of crude, i. e., at a "specific" loss, it is necessary to cover such losses in the prices charged for gasoline. This, in effect, means that the losses on other products than gasoline should be charged to the cost of gasoline. Such other products are treated therefore as incidental by-products. The average cost

of all products yielded during the period under consideration is first computed, and then this cost is compared with the average receipts for all products other than gasoline sold during the same period. To determine the cost of gasoline, losses are added and gains deducted from the average cost of all products. This method considers gasoline as the principal product and treats all others as incidental by-products. This gives what may be considered as a maximum cost of gasoline. The result is not, therefore, a specific cost of production. As this method assumes that the business is run chiefly for gasoline and that the other products are by-products incidental to the production of gasoline, it may be called a joint-cost, or "by-products method."[1]

[1] ADJUSTMENTS MADE BY THE COMMISSION.—Under the caption of general expenses are included general administration expenses, taxes, depreciation, and insurance. In most instances the annual taxes, depreciation, and insurance have been divided equally between the two half-year periods. In some instances general expenses were also divided equally between the two periods. The returns for refinery selling expenses are unsatisfactory in many instances, as some of the companies evidently charge into their general expenses a large part of the expenses which legitimately belong to the selling end of the refinery operations.

STANDARD OF INDIANA.—Only the Whiting and Sugar Creek works have been covered for this company. Costs for this company have been computed by the two chief methods. Costs and sales of compounds and greases, however, are excluded. In addition to the straight-run process, it also produces gasoline from pressure stills.

STANDARD OF NEW YORK—BUFFALO PLANT.—Costs for this company have been computed by both methods. In addition to the straight-run process, it also produces naphtha from pressure stills. Aside from the general expenses, including insurance, depreciation, and taxes, directly chargeable to the Buffalo works, there was a large general expense item for the general office in New York. In the absence of any data as to the correct apportionment of this item between the different works and the foreign business, the Commission has estimated 5 per cent as belonging to the Buffalo works. Costs of compounds and greases have been excluded, but from the data obtained it was impossible to exclude these products from the sales.

ATLANTIC REFINING CO.—PHILADELPHIA PLANT.—Costs for this company have been computed by both methods. In addition to the straight-run process, it also produces naphtha from pressure stills. The general expense items are as apportioned by the company to the Philadelphia works. Costs of compounds and greases have been excluded, but from the data obtained it was impossible to exclude these products from the sales.

STANDARD OF OHIO.—Costs for this company have been computed by both methods. The costs and sales of compounds and greases have been excluded.

COMPANY A.—Costs for Company A have been computed by both methods. Compounds and greases have been excluded from both costs and sales. This company is the only company where any deviation has been made from the system of using the same figures for crude oil in computing costs by the two different methods. In the case of all the other companies for which costs have been computed by both methods, the same quantity and value of crude oil has been used in both methods. In computing costs for this company by the average specific cost method several million gallons of "crude equivalent" (residual products, re-run) have been included, as the exclusion of this gallonage would show a very much larger production from the first distillation than the quantity of crude actually charged into the stills. Even as it is, there is a larger production shown for the second half year than the quantity of crude and equivalent charged in. In obtaining the cost of gasoline by the second method, the crude oil actually run into the stills, excluding the crude equivalent, is used. This is the same figure that is used by the company itself in computing the cost of production for all products. It will be observed that this company in addition to obtaining crude naphtha from the first distillation also obtains naphtha from standard white distillate by running it through the reducing stills.

COMPANY B.—Costs for this company have been computed by both methods. Compounds and greases are excluded from both costs and sales.

COMPANY D.—From the data available costs could be computed for this company only by the second method. No lubricants, compounds, or greases are produced.

COMPANY E.—From the data available, costs could be computed for this company only by the second method. No lubricants, compounds, or greases are produced.

COMPANY C.—From the data available, costs could be computed for this company only by the second method. No lubricants, compounds, or greases are produced. This company operates three refineries. Costs were obtained for two of these only and it is the combined cost of these two plants which is shown in the table. General expenses, however, were shown for all three plants combined, and this has been prorated on the basis of the crude run by the different plants. Refinery marketing costs were prorated on the same basis. The sales shown, however, are for all three plants combined, and instead of eliminating

Section 5. Refineries covered in special cost investigation.

The refineries for which complete cost data have been secured by the Commission's agents, were chosen on account of their representative character, size, location of market, kind of crude oil used, and business affiliations all being considered. Thus they include eastern, middle-western and Gulf coast refiners; large and small plants in the eastern and western groups; and of the 10 companies, 4 are known as Standard concerns and 6 are not. The results obtained from all have been presented in so far as available in full and without selection. The names of the companies and the refineries covered by the investigation follow:

1. Atlantic Refining Co. (Philadelphia, Pa., refinery).
2. Pure Oil Co. (Marcus Hook, near Philadelphia, Pa., refinery).
3. Standard of New York (Buffalo, N. Y., refinery).
4. Standard of Ohio (Cleveland, Ohio, refinery).
5. Cosden & Co. (Cushing and West Tulsa, Okla., refineries).
6. Standard of Indiana (Whiting, Ind., and Sugar Creek, Mo., refineries).
7. Muskogee Refining Co. (Muskogee, Okla., refinery).
8. Milliken Refining Co. (Vinita, Okla., refinery).
9. Sapulpa Refining Co. (Sapulpa, Okla., refinery).
10. Gulf Refining Co. (Port Arthur, Tex., refinery).

The names of the five smaller refineries in the above list, four of which are Mid-Continent refineries located in Oklahoma, are not shown in connection with their costs. They are designated by letters to avoid their identification. While they are small as compared with the Standard and Gulf companies, they were among the most important "independent" refiners.

Section 6. Average specific cost of gasoline.

According to the method of average specific cost an average cost per gallon is secured which puts all products on the same basis and does not allow for the fact that some may be regarded as by-products. Nevertheless it is desirable to compute a specific cost, even though it is only an average; for it is only because some of the products can not be sold for enough to cover this average cost that they may be regarded as by-products. In Table 20 are shown the average costs per gallon of product of each of the processes involved in the manufacture of gasoline. The data have been drawn from the books of seven refineries owned by six different companies. They are believed to be fairly typical of all conditions, except those of the Gulf coast and California refiners, and perhaps the small Pennsylvania refiners.

one refinery by some arbitrary method, the Commission has taken the cost of production at the other two refineries and considered it as the cost of sales for the sales of all three refineries. There can obviously be little error in this method of procedure, for over 90 per cent of the production is from these two refineries.

GULF REFINING CO.—PORT ARTHUR PLANT.—From the data available, costs could be computed for this company only by the second method. The costs and sales of compounds and greases have been excluded. Depreciation was allocated between the Port Arthur and Fort Worth plants on the basis of plant investment. Taxes were allocated on the basis of plant investment and real estate.

TABLE 20.—AVERAGE SPECIFIC COST OF PRODUCING A GALLON OF GASOLINE AT SEVEN REPRESENTATIVE REFINERIES, BY SIX-MONTH PERIODS, 1915.

[All figures in cents per gallon.]

Item.	Standard of New York, Buffalo plant.		Atlantic Refining Co., Philadelphia plant.		Standard of Ohio.	
	Jan.–June.	July–Dec.	Jan.–June.	July–Dec.	Jan.–June.	July–Dec.
Crude still cost:						
Cost per gallon crude oil and equivalent[1]	3.04	3.18	3.47	3.63	3.07	2.99
Operating expenses and loss[2]	.57	.43	.27	.39	.46	.47
General expenses	.38	.48	.24	.26	.53	.59
Total cost per gallon of all products of first distillation (including crude naphtha, gas oil, etc.)	3.99	4.09	3.98	4.28	4.06	4.05
Pressure still cost:						
Cost of fuel and gas oil, etc.[3]	3.99	4.09	3.98	4.28	.....	.....
Operating expenses and loss	.42	.45	.56	.64	.....	.....
Total cost of all products (including crude naphtha, etc.)	4.41	4.54	4.54	4.92	.....	.....
Naphtha cost:						
Cost of crude naphtha produced—						
Naphtha from first distillation	3.99	4.09	3.98	4.28	4.06	4.05
Naphtha from pressure stills	4.41	4.54	4.54	4.92	.....	.....
Weighted average cost of crude naphtha[4]	4.13	4.26	4.05	4.38	4.06	4.05
Operating expenses and loss in treating naphtha	.11	.10	.14	.16	.08	.08
Total cost of treated naphtha	4.24	4.36	4.19	4.54	4.14	4.13
Operating expenses and loss in finishing naphtha	.15	.18	.28	.21	.09	.09
Total cost of finished naphtha (gasoline)[5]	4.39	4.54	4.47	4.75	4.23	4.22
F. o. b. refinery price of gasoline	7.21	10.25	8.97	10.29	7.15	8.60
Margin	2.82	5.71	4.50	5.54	2.92	4.38

For footnotes see p. 78.

TABLE 20.—AVERAGE SPECIFIC COST OF PRODUCING A GALLON OF GASOLINE AT SEVEN REPRESENTATIVE REFINERIES, BY SIX-MONTH PERIODS, 1915—Continued.

[All figures in cents per gallon.]

Item.	Standard of Indiana, Sugar Creek plant.		Standard of Indiana, Whiting plant.		Company A.		Company B.	
	Jan.–June.	July–Dec.	Jan.–June.	July–Dec.	Jan.–June.	July–Dec.	Jan.–June.	July–Dec.
Crude still cost:								
Cost per gallon crude oil and equivalent[1]	2.16	2.74	2.48	3.18	4.63	5.12	1.39	1.97
Operating expenses and loss[2]	.29	.39	.27	.30	.22	.14	.26	.21
General expenses	.16	.15	.23	.18	.22	.20	.35	.22
Total cost per gallon of all products of first distillation (including crude naphtha, gas oil, etc.)	2.61	3.28	2.98	3.66	5.07	5.46	2.00	2.40
Pressure still cost:								
Cost of fuel and gas oil, etc.[3]	2.61	3.28	2.98	3.66	[5] 5.07	[5] 5.46	.....	.....
Operating expenses and loss	.36	.37	.29	.36	.29	.31	.....	.....
Total cost of all products (including crude naphtha, etc.)	2.97	3.65	3.27	4.02	5.36	5.77	.....	.....
Naphtha cost:								
Cost of crude naphtha produced—								
Naphtha from first distillation	2.61	3.28	2.98	3.66	5.07	5.46	2.00	2.40
Naptha from pressure stills	2.97	3.65	3.27	4.02	5.36	5.77	.....	.....
Weighted average cost of crude naphtha[4]	2.83	3.49	3.13	3.88	5.09	5.48	2.00	2.40
Operating expenses and loss in treating naphtha	.08	.08	.11	.11	.10	.09	.14	.07
Total cost of treated naphtha	2.91	3.57	3.24	3.99	5.19	5.57	2.14	2.47
Operating expenses and loss in finishing naphtha	.21	.30	.14	.22	.15	.32	.14	.12
Total cost of finished naphtha (gasoline)[6]	3.12	3.87	3.38	4.21	5.34	5.89	2.28	2.59
F. o. b. refinery price of gasoline	6.10	7.10	7.24	8.27	8.54	11.43	5.95	8.13
Margin	2.98	3.23	3.86	4.06	3.20	5.54	3.67	5.54

[1] "Crude oil and equivalent": "Crude equivalent" consists of residual products of previous operations which are redistilled along with crude oil.

[2] "Operating expense and loss": By adding loss in manufacture at this point, the product is made equivalent to crude oil, or, in other words, the products are made to total 100 per cent of the crude, so that the computation is carried on on the basis of a gallon of refined products.

[3] "Cost of fuel and gas oil": These are residual products of the crude stills that are run into pressure stills to be "cracked." They are charged to the process at the average cost per gallon of all the products of the crude stills, so the figure used is the same as the cost of crude naphtha.

[4] "Average cost of crude naphtha": This is a weighted average of the cost of the crude naphtha yielded by the crude stills and of that yielded by other processes (e. g., pressure stills). The weights used are the gallons of naphtha from each source.

[6] A small amount of refinery selling costs is not included.

[5] Standard white distillate used in reducing stills.

The table shows that, on the assumption that other products should bear their pro rata share of the cost, in 1915 the average cost per gallon of gasoline varied among the different refineries between 2.28 cents and 5.34 cents in the first half of the year and between 2.59 cents and 5.89 cents in the second half. The great bulk of the gasoline of these representative refineries was produced at a cost of less than 5 cents per gallon, if the losses on other products be ignored.

The costs of the eastern refiners were higher largely because of the expense of transporting crude oil from Oklahoma, while Company B's costs were low for the opposite reason.

From this table it appears that in each case the half-year average margins between the average specific cost of a gallon of gasoline and the price thereof at the refinery, increased materially in 1915. The average margin for the second six months ranged from 3.23 cents for the Sugar Creek plant of the Standard of Indiana up to 5.71 cents at the Buffalo plant of the Standard of New York. It is a striking fact that the margins were so nearly the same for the Standard of New York, the Atlantic Refining Co., Company A and Company B, those for the last three being 5.54 cents between July and December, 1915.

MONTHLY AVERAGE SPECIFIC COST OF GASOLINE FOR SEVEN REPRESENTATIVE REFINERIES.—So much importance attaches to the gasoline price situation in the second half of 1915 that the average specific costs of seven representative refineries have been computed by months. Though not so accurate as the six-month figures, on account of the necessity of prorating some items between the months, the figures show the trend of costs and margins with reasonable accuracy. They are arrived at by the same general method followed in making up the preceding table (Table 20).

TABLE 21.—MONTHLY AVERAGE SPECIFIC COSTS, PRICES, AND MARGINS PER GALLON OF GASOLINE, FOR SEVEN REPRESENTATIVE REFINERIES, BY MONTHS, JULY-DECEMBER, 1915.

[All figures in cents per gallon.]

Item.	Standard of New York (Buffalo plant).						Atlantic Refining Co. (Philadelphia plant).					
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Crude still cost:												
Cost per gallon of crude oil and equivalent [1]	2.87	2.88	2.87	3.19	3.57	3.68	3.44	3.28	3.49	3.63	4.11	4.13
Operating expenses and loss [2]	.46	.41	.37	.37	.52	.43	.19	.44	.33	.44	.47	.32
General expenses	.50	.45	.52	.49	.49	.45	.25	.22	.24	.26	.29	.35
Total cost per gallon of all products of first distillation (including crude naphtha, gas oil, etc.)	3.83	3.74	3.76	4.05	4.58	4.56	3.88	3.94	4.06	4.33	4.87	5.00
Pressure still cost:												
Cost of fuel and gas oil, etc. [3]	3.83	3.74	3.76	4.05	4.58	4.56	3.88	3.94	4.06	4.33	4.87	5.00
Operating expenses and loss	.32	.36	.47	.57	.48	.54	.58	.60	.57	.69	.69	.74
Total cost per gallon of all products from pressure stills (including crude naphtha, etc.)	4.15	4.10	4.23	4.62	5.06	5.10	4.46	4.54	4.63	5.02	5.56	5.74
Naphtha cost:												
Cost of crude naphtha produced—												
Crude naphtha from first distillation	3.83	3.74	3.76	4.05	4.58	4.56	3.88	3.94	4.06	4.33	4.87	5.00
Crude naphtha from pressure stills	4.15	4.10	4.23	4.62	5.06	5.10	4.46	4.54	4.63	5.02	5.56	5.74
Weighted average cost of crude naphtha [4]	3.95	3.87	3.96	4.28	4.76	4.76	3.96	4.02	4.15	4.44	4.99	5.18
Operating expenses and loss in treating naphtha	.10	.09	.09	.10	.11	.11	.13	.14	.15	.17	.16	.21
Total cost of treated naphtha	4.05	3.96	4.05	4.38	4.87	4.87	4.09	4.16	4.30	4.61	5.15	5.39
Operating expenses and loss in finishing naphtha	.17	.15	.15	.17	.20	.22	.15	.08	.29	.30	.30	.19
Total cost of finished naphtha (gasoline) [5]	4.22	4.11	4.20	4.55	5.07	5.09	4.24	4.24	4.59	4.91	5.45	5.58
F. o. b. refinery prices	8.03	8.98	10.59	11.29	12.20	13.72	8.18	9.00	9.63	11.21	11.88	13.50
Margin	3.81	4.87	6.39	6.74	7.13	8.63	3.94	4.76	5.04	6.30	6.43	7.92

For footnotes see p. 83.

TABLE 21.—MONTHLY AVERAGE SPECIFIC COSTS, PRICES, AND MARGINS PER GALLON OF GASOLINE, FOR SEVEN REPRESENTATIVE REFINERIES, BY MONTHS, JULY-DECEMBER, 1915—Continued.

[All figures in cents per gallon.]

	Standard of Indiana.											
	Whiting plant.						Sugar Creek plant.					
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Crude still cost:												
Cost per gallon of crude oil and equivalent [1]	2.42	2.60	3.23	3.43	3.43	3.89	2.12	2.23	2.82	3.07	3.06	3.17
Operating expenses and loss [2]	.28	.29	.31	.31	.29	.25	.28	.32	.46	.42	.45	.42
General expenses	.19	.19	.18	.18	.18	.18	.16	.14	.16	.14	.15	.17
Total cost per gallon of all products of first distillation (including crude naphtha, gas oil, etc.)	2.89	3.08	3.72	3.92	3.90	4.32	2.56	2.69	3.44	3.63	3.66	3.76
Pressure still cost:												
Cost of fuel and gas oil, etc. [3]	2.89	3.08	3.72	3.92	3.90	4.32	2.56	2.69	3.44	3.63	3.66	3.76
Operating expenses and loss	.33	.33	.34	.38	.37	.39	.37	.34	.38	.43	.35	.32
Total cost of crude naphtha	3.22	3.41	4.06	4.30	4.27	4.71	2.93	3.03	3.82	4.06	4.01	4.08
Naphtha cost:												
Cost of crude naphtha produced—												
Crude naphtha from first distillation	2.89	3.08	3.72	3.92	3.90	4.32	2.56	2.69	3.44	3.63	3.66	3.76
Crude naphtha from pressure stills	3.22	3.41	4.06	4.30	4.27	4.71	2.93	3.03	3.82	4.06	4.01	4.08
Weighted average cost of crude naphtha [4]	3.08	3.29	3.95	4.16	4.12	4.56	2.76	2.86	3.68	3.91	3.87	3.90
Operating expenses and loss in treating naphtha	.10	.10	.10	.11	.12	.12	.07	.07	.08	.11	.09	.08
Total cost of treated naphtha	3.18	3.39	4.05	4.27	4.24	4.68	2.83	2.93	3.76	4.02	3.96	3.98
Operating expenses and loss in finishing naphtha	.13	.21	.18	.28	.25	.28	.24	.24	.39	.39	.34	.25
Total cost of finished naphtha (gasoline) [6]	3.31	3.60	4.23	4.55	4.49	4.96	3.07	3.17	4.15	4.41	4.30	4.23
f. o. b. refinery price	6.72	6.89	7.41	8.57	10.04	11.84	5.79	5.82	6.39	7.28	9.08	10.95
Margin	3.41	3.29	3.18	4.02	5.55	6.88	2.72	2.65	2.24	2.87	4.78	6.72

For footnotes see p. 83.

TABLE 21.—MONTHLY AVERAGE SPECIFIC COSTS, PRICES, AND MARGINS PER GALLON OF GASOLINE, FOR SEVEN REPRESENTATIVE REFINERIES, BY MONTHS, JULY-DECEMBER, 1915—Continued.

[All figures in cents per gallon.]

	Company A.						Company B.					
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Crude still cost:												
Cost per gallon of crude oil and equivalent[1]	4.58	4.73	5.02	5.15	5.92	5.40	1.20	1.51	1.96	2.09	2.25	2.53
Operating expenses and loss[2]	.13	.08	.10	.21	.04	.24	.22	.18	.20	.24	.24	.20
General expenses	.22	.19	.19	.22	.22	.21	.25	.21	.24	.21	.24	.21
Total cost per gallon of all products of first distillation (including crude naphtha, gas oil, etc)	4.93	5.00	5.31	5.58	6.18	5.85	1.67	1.90	2.40	2.54	2.73	2.94
Pressure still cost:[3]												
Cost of fuel and gas oil, etc.[3]	[5]4.93	[5]5.00	[5]5.31	[5]5.58	[5]6.18	[5]5.85	.....	.....	.....	.....	.....	.....
Operating expenses and loss	.28	.25	.29	.30	.46	.34	.....	.....	.....	.....	.....	.....
Total cost per gallon of all products from pressure stills (including crude naphtha, etc.)	5.21	5.25	5.60	5.88	6.64	6.19	.....	.....	.....	.....	.....	.....
Naphtha cost:												
Cost of crude naphtha produced—												
Crude naphtha from first distillation	4.93	5.00	5.31	5.58	6.18	5.85	1.67	1.90	2.40	2.54	2.73	2.94
Crude naphtha from pressure stills	5.21	5.25	5.60	5.88	6.64	6.19	.....	.....	.....	.....	.....	.....
Weighted average cost of crude naphtha[4]	4.95	5.02	5.33	5.61	6.21	5.87	1.67	1.90	2.40	2.54	2.73	2.94
Operating expenses and loss in treating naphtha	.09	.09	.11	.08	.12	.08	.11	.09	.09	.06	.06	.05
Total cost of treated naphtha	5.04	5.11	5.44	5.69	6.33	5.95	1.78	1.99	2.49	2.60	2.79	2.99
Operating expenses and loss in finishing naphtha	.28	.30	.41	.21	.35	.37	.13	.11	.11	.14	.14	.12
Total cost of finished naphtha (gasoline)[6]	5.32	5.41	5.85	5.90	6.68	6.32	1.91	2.10	2.60	2.74	2.93	3.11
F. o. b. refinery price	8.85	9.60	10.77	11.65	13.00	15.46	5.82	5.91	6.72	8.42	9.47	10.73
Margin	3.53	4.19	4.92	5.75	6.32	9.14	3.91	3.81	4.12	5.68	6.54	7.62

For footnotes see p. 83

TABLE 21.—MONTHLY AVERAGE SPECIFIC COSTS, PRICES, AND MARGINS PER GALLON OF GASOLINE, FOR SEVEN REPRESENTATIVE REFINERIES, BY MONTHS, JULY-DECEMBER, 1915—Continued.

[All figures in cents per gallon.]

	Standard of Ohio.					
	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Crude still cost:						
Cost of crude oil and equivalent[1]	2.85	2.85	2.85	2.86	3.01	3.46
Operating expenses and loss[2]	.49	.43	.48	.43	.50	.50
General expenses	.76	.56	.62	.51	.58	.54
Total cost of crude naphtha	4.10	3.84	3.95	3.80	4.09	4.50
Naphtha cost:						
Operating expenses and loss in treating naphtha	.08	.08	.08	.08	.08	.08
Total cost of treated naphtha	4.18	3.92	4.03	3.88	4.17	4.58
Operating expenses and loss in finishing naphtha	.09	.09	.09	.09	.09	.10
Total cost of finished naphtha (gasoline)	4.27	4.01	4.12	3.97	4.26	4.68
F. o. b. refinery price	6.54	7.05	8.05	8.66	10.61	12.44
Margin	2.27	3.04	3.93	4.69	6.35	7.76

* Reducing stills.

[1] "Crude oil and equivalent": "Crude equivalent" consists of residual products of previous operations which are redistilled along with crude oil.

[2] "Operating expenses and loss": By adding loss in manufacture at this point, the product is made equivalent to crude oil, or, in other words, the products are made to total 100 per cent of the crude, so that the computation is carried on on the basis of a gallon of refined products.

[3] "Cost of fuel and gas oil": These are residual products of the crude stills that are run into pressure stills to be "cracked." They are charged to the process at the average cost per gallon of all the products of the crude stills, so the figure used is the same as the cost of crude naphtha.

[4] "Average cost of crude naphtha": This is a weighted average of the cost of the crude naphtha yielded by the crude stills and of that yielded by other processes (e. g., pressure stills). The weights used are the gallons of naphtha from each source.

[5] Standard white distillate used in reducing stills.

[6] A small amount of refinery selling costs is not included.

The table shows that average specific costs, on the whole, increased steadily between July and December, 1915, the average December cost being in advance of the average July cost by from 0.41 cent (Standard of Ohio) to 1.65 cents (Standard of Indiana, Whiting plant).

The refinery price, however, increased so much more rapidly that the average margins between specific cost and refinery price were much greater in December. The smallest increase was at the Indiana company's Whiting plant, where this margin rose from 3.41 cents to 6.88 cents, an increase of 3.47 cents. The largest increase occurred at the plant of Company A, where the margin over average specific cost rose from 3.53 cents to 9.14 cents, an advance of 5.61 cents per gallon.

The table throws some light on the situation in the Standard of Indiana's territory and the relation of that situation to the Ohio company's prices. There was an increase in average specific cost at the Standard of Indiana's plant both in August and September, which might logically have caused an increase in price. As a matter of fact, though the Standard of Ohio advanced its price—without an increase in cost—the Indiana company did not advance its prices till September 15. On the other hand, the increase in its monthly

average cost between September and December was much less than the increase in the average tank-wagon prices of gasoline, which prices were 9.61[1] and 15.69, respectively. (See p. 198.) The costs at the Indiana company's and the Ohio company's plants were not so dissimilar as were the prices in the two territories in which these companies marketed their products. (See p. 115.)

The advance in margins shown by the foregoing table has been emphasized, rather than the amount of such margins, for the reason that the cost used is a minimum cost (see p. 73) and should in most cases be increased by the amount of losses on by-products.

Section 7. Total average cost per gallon of all products.

Partly in order to check the accuracy of the figures showing average specific cost, and partly to obtain data concerning other companies for which information was insufficient to enable the computation of specific costs, Table 22, showing total average refining cost per gallon of all products, has been prepared. In this table the figures shown in the column headed "Average cost" are obtained by dividing the total expense of refining, treating, and finishing all refined products by the gallons of all products produced. They are not built up on the basis of the costs of the different processes involved, as is the case with "Average specific costs." As they include costs of finishing such expensive products as lubricating oils, they are naturally somewhat greater than the average specific cost of gasoline.

TABLE 22.—AVERAGE SPECIFIC COST OF GASOLINE AND THE AVERAGE OF TOTAL REFINING COSTS PER GALLON OF ALL PRODUCTS (INCLUDING GASOLINE) FOR REPRESENTATIVE COMPANIES, BY SIX-MONTH PERIODS, 1915.

[All figures in cents per gallon.]

Company.	January–June.		July–December.	
	Average cost, all products including gasoline.[2]	Specific cost of gasoline.	Average cost, all products including gasoline.[2]	Specific cost of gasoline.
	Cents.	*Cents.*	*Cents.*	*Cents.*
Standard of New York, Buffalo plant	4.96	4.39	5.00	4.54
Atlantic Refining Co., Philadelphia plant	4.52	4.47	4.91	4.75
Standard of Ohio	4.57	4.23	4.54	4.22
Standard of Indiana:				
Sugar Creek plant	2.95	3.12	3.70	3.87
Whiting plant	3.61	3.38	4.40	4.21
Company A	5.85	5.34	6.39	5.89
Company B	2.26	2.28	2.62	2.59
Company C	1.58	.....	2.66	.....
Company D	2.03	.....	3.13	.....
Company E	1.62	.....	2.85	.....
Gulf Refining Co	2.63	.....	3.01	.....

[1] Quantity-discount basis.

[2] "Average cost" is obtained by dividing the gallons of all products into the total cost of production, not including refinery marketing. (A fair allowance for this item is about 0.07 cent per gallon.) The "average cost" is greater than "specific cost" for the reason that it includes all refining costs on all products, including such costs as filtering lubricating oils, sweating and pressing wax distillate, etc. In the case of the Sugar Creek plant of the Standard of Indiana, no lubricating oil was manufactured and the "average cost" is smaller than the specific cost.

A rather close parallelism is apparent between the two sets of cost figures, as they vary for the different companies and the different periods in the same direction and in much the same degree.

This fact makes the total average costs as shown for the additional companies (Companies C, D, and E, and Gulf Refining Co.) of considerable interest. The first three of these companies are in the same general class with Company B and show the low cost obtaining among the medium-sized Mid-Continent refiners located in the oil fields. It is such companies as these that have been able to compete—chiefly through jobbers—with the Standard of Indiana and others of the Standard companies.

Section 8. Cost of gasoline, based on "by-products method."

COSTS AND MARGINS PER GALLON OF GASOLINE PRODUCED; SIX-MONTH AVERAGES.—There follows a table in which the total cost is computed per gallon of all products, and after deducting net gains or adding net losses from products other than gasoline, the balance is called the "cost" of gasoline. That is, losses or gains on all products other than gasoline are charged to gasoline directly. (See p. 73.) As the cost is figured per gallon of gasoline and of other products, it is based on product rather than on crude oil.

In considering the margins shown in the following tables it should be remembered that they have been computed per gallon of gasoline produced during the six months, or the individual months, and that the quantity of gasoline sold during the period covered was generally widely different from the quantity produced. In the first place, some of the gasoline sold during any one of the periods covered was produced at an earlier time. In the second place, there is always some lag between the production and the sale of gasoline, so that the gasoline produced in a given month or half year is never, even in periods of great demand, entirely disposed of within the same period, and at times when current production exceeds current sales the lag may be considerable. The quantity of gasoline products sold during the second half of 1915 exceeded the quantity produced by approximately 350,000,000 gallons or by from 45 to 50 per cent. Thus, a very large quantity, mostly produced and stored when prices were lower and when costs of production were different from those prevailing at the time of sale, was disposed of during that period. For these reasons the margins shown in the following tables indicate not the actual profits, but what would have been the profits had the various refined products all been entirely sold in the month produced and at the prices that were received for the quantities actually sold.

TABLE 23.—TOTAL AVERAGE COST, AVERAGE VALUE, AND AVERAGE MARGIN PER GALLON OF GASOLINE PRODUCED, TREATING PRODUCTS OTHER THAN GASOLINE AS BY-PRODUCTS FOR SIX REPRESENTATIVE REFINERIES, SIX-MONTH PERIODS, 1915.

[All figures in cents per gallon.]

Item.	Standard of New York, Buffalo plant.		Atlantic Refining Co., Philadelphia plant.		Standard of Indiana, Whiting plant.	
	Jan.–June.	July–Dec.	Jan.–June.	July–Dec.	Jan.–June.	July–Dec.
Average cost of crude oil and equivalent	3.04	3.18	3.47	3.63	2.48	3.18
Operating expenses and loss	1.55	1.34	.81	1.02	.90	1.06
General expenses	.38	.48	.24	.26	.23	.18
Refinery selling expenses	.06	.07	.02	.02	.12	.13
Average cost of all products	5.03	5.07	4.54	4.93	3.73	4.54
Average net loss on products other than gasoline	1.12	1.47	[1] 3.35	[1] 1.11	[1] .62	[1] .47
Total cost per gallon of gasoline produced	6.15	6.54	1.19	3.82	3.11	4.07
Average net value per gallon of gasoline sold	7.21	10.25	8.97	10.29	7.24	8.27
Average margin per gallon of gasoline produced [2]	1.06	3.71	7.78	6.47	4.13	4.20

Item.	Standard of Indiana, Sugar Creek plant.		Company A.		Company B.	
	Jan.–June.	July–Dec.	Jan.–June.	July–Dec.	Jan.–June.	July–Dec.
Average cost of crude oil and equivalent	2.16	2.74	4.63	5.16	1.39	1.97
Operating expenses and loss	.63	.81	.96	1.00	.63	.43
General expenses	.16	.15	.26	.24	.35	.22
Refinery selling expenses	.05	.06	.04	.03	.21	.15
Average cost of all products	3.00	3.76	5.89	6.43	2.58	2.77
Average net loss on products other than gasoline	1.97	2.23	2.34	2.22	2.47	2.46
Total cost per gallon of gasoline produced	4.97	5.99	8.23	8.65	5.05	5.23
Average net value per gallon of gasoline sold	6.10	7.10	8.54	11.43	5.95	8.13
Average margin per gallon of gasoline produced [2]	1.13	1.11	.31	2.78	.90	2.90

[1] Gain.

[2] The Atlantic Refining Co. and the Whiting plant of the Standard of Indiana made gains on combined products other than gasoline which made their full margins larger than those properly attributable to gasoline. The Whiting plant produced lubricating oil, while the Sugar Creek plant did not; and the sales of the Sugar Creek plant were partly made in territory where prices were lowest.

The figure representing the average total "cost" according to the by-products method varies between 1.19 cents and 8.23 cents per gallon in the first six months, and between 3.82 cents and 8.65 cents in the second six months. The wide ranges do not lie in cost of gasoline proper, but in the amounts of loss or gain on other products. Thus, in the first six months, while Company B lost an average of 2.47 cents per gallon of gasoline on the sale of other products, the Atlantic Refining Co. gained 3.35 cents. That the average total "cost" was greater in the second six months is

apparent; but the difference was small, the maximum increase in total "cost" between the two periods, excepting the Atlantic Refining Co., being but 1.02 cents.

The average refinery prices per gallon of gasoline are shown to have ranged between 5.97 and 8.97 cents in the first half year; and between 7.10 and 11.43 cents in the second period. The relative lowness of the prices at the Standard of Indiana's plants—especially the Sugar Creek refinery—and Company B's plant, are notable.

The refinery margins, according to the method here used, varied in the first six months from 0.31 cent to 7.78 cents, and in the second six months from 1.11 to 6.47 cents. Using "costs" computed according to the by-products method, the table shows (1) that all the companies covered made good margins during the second six months, and that a majority did so during the first half year; (2) that, with two exceptions, these companies made increased margins in the second half year. One of these exceptions, that of the Atlantic Refining Co., illustrates the weakness of a method of computing "costs" in which gains on other products are deducted from gasoline costs, and will be discussed in the following paragraphs. The other exceptional case is that of the Sugar Creek plant of the Standard of Indiana, where the low average price in the second half year, coupled with a relatively large increase in cost in the same period, explains the exception.

The fact that the Atlantic Refining Co., at its Philadelphia plant, showed a decreased margin in the second six months is not to be taken to indicate that this refinery made less on its gasoline during that period. The decreased margin is entirely due to gains, not to losses, and arises from the fact that by the method of computation used, when profits are made on products other than gasoline such profits are deducted from the cost of gasoline. Consequently, as the refinery referred to was making good profits on its lubricating oil in 1915, its "cost" by this method is shown at a figure which is too low; and, as its profit on products other than gasoline (when figured per gallon of gasoline) appears to have been a little less in the second than in the first half of the year, its "cost" of gasoline is made to appear relatively high in the second half of the year. Of course, this causes its margin to appear lower in the second half. It will be observed that by this method this company shows exceptionally large margins in both of the six-month periods of 1915.

The exceptional character of the Atlantic Refining Co. shows the weakness of such a by-products method and indicates that in cases in which there are products other than gasoline which are an important source of gain and a main product, other products should be treated separately and not be charged to gasoline. A table which shows the cost and margin per gallon of gasoline for the refinery in question without deducting gains on other products is presented next.

TABLE 24.—MARGIN PER GALLON OF GASOLINE, ATLANTIC REFINING CO. (PHILADELPHIA REFINERY), GAINS ON OTHER PRODUCTS NOT ADDED.

[All figures in cents.]

Item.	Jan.-June.	July-Dec.
Average net value per gallon of gasoline sold	8.97	10.29
Average cost of all products	4.54	4.93
Average margin per gallon of gasoline, gains on other products not added	4.43	5.36

The margin obtained by deducting the average cost of all products (including gasoline) from the average value per gallon of gasoline, without adding gains from products other than gasoline—chiefly lubricating oil—are more in line with the figures of the other companies and show the increased margin on gasoline which was really received.

The situation of the Standard of Ohio is so different from that of the other refineries shown in the table that this company should be treated separately. In the first place, the Ohio company purchased nearly three-fourths of the 69,883,000 gallons of gasoline products sold by it in 1915, buying 37,817,000 gallons, or over half the quantity sold, from the Standard of Indiana. Its chief source of profits is its marketing business. Naturally, therefore, it takes such profits as it makes in the sale of its own refinery products through its marketing department, and consequently it shows but small margins at the refinery. The costs, refinery prices, and margins at its refinery are shown in the following table:

TABLE 25.—TOTAL AVERAGE COST, AVERAGE VALUE, AND AVERAGE MARGIN PER GALLON OF GASOLINE PRODUCED AT THE STANDARD OF OHIO'S REFINERY, TREATING PRODUCTS OTHER THAN GASOLINE AS BY-PRODUCTS, SIX-MONTH PERIODS, 1915.

[All figures in cents per gallon.]

Item.	Standard of Ohio.	
	Jan.-June.	July-Dec.
Average cost of crude oil and equivalent	3.07	2.99
Operating expenses and loss	.97	.96
General expenses	.53	.59
Refinery selling expenses	.01	.01
Average cost of all products	4.58	4.55
Average net loss on products other than gasoline	3.37	4.23
Total cost per gallon of gasoline produced	7.95	8.78
Average net value per gallon of gasoline produced	7.15	8.60
Average margin per gallon of gasoline produced	—.80	—.18

The average net loss on products other than gasoline is so large as to be especially noticeable. The average margins for the six-month periods appears to have been slight losses. Similar results are obtained when the margins are computed on the basis of a gallon of gasoline *sold*.

The Standard of Ohio comes closer to selling all its products through its marketing stations than most other companies, and it appears that its policy is to bill its gasoline to its sales stations at an arbitrary transfer price f. o. b. its refinery that is based upon the price it pays the Standard of Indiana, f. o. b. Woodriver, Ill., plus the difference between the freight rate from Woodriver to Ohio and the freight rate from Cleveland to Ohio points. This transfer price approximately covers the Ohio company's refinery costs, leaving profits to be made by its marketing department. This company sold very little gasoline direct from its refinery. To get a comparison with the other companies, therefore, it is necessary to work back from the tank-wagon price to ascertain what profit may be properly attributed to refinery operations. By deducting from the tank-wagon price, the freight and marketing costs per gallon the "net back" to the refinery is secured; and, while this "net back" is correct only for gasoline sold by tank-wagon delivery, in the case of this company it is believed to cover the cost with a fair degree of accuracy. The following brief statement shows a comparison for the Standard of Ohio between "net back" to refinery and total average cost per gallon of gasoline:

MARGIN BETWEEN STANDARD OF OHIO'S "NET BACK" TO REFINERY ON GASOLINE SALES AND TOTAL AVERAGE COST OF GASOLINE (BY-PRODUCTS METHOD), SIX-MONTH PERIODS, 1915.

[All figures in cents per gallon.]

Item	Jan.-June.	July-Dec.
"Net back" to refinery per gallon of gasoline	8.08	10.27
Total cost per gallon of gasoline sold	7.66	9.12
Margin between "net back" and cost	.42	1.15

The statement shows that on the basis of a gallon of gasoline, the Standard of Ohio "netted back" at the refinery an average margin of 0.42 cent during the first six months of 1915 and 1.15 cents during the second six months. This was in spite of its large average net loss on products other than gasoline. As the Standard of Ohio in 1915 bought about 75 per cent of its gasoline from other Standard companies, chiefly from the Standard of Indiana, its own refinery costs have relatively little significance.

COST AND MARGINS PER GALLON OF GASOLINE PRODUCED; FOR THREE REFINERIES WHICH PRODUCED NO CONSIDERABLE QUANTITIES OF LUBRICATING OILS, SIX-MONTH AVERAGES.—In addition to the "costs"

and margins for the seven representative refineries as presented in the preceding pages, the Commission has similar data from the books of two Mid-Continent refiners and a Gulf coast company, none of which produced any considerable quantity of lubricating oils in 1915. As these refineries produced virtually no lubricating oils and used either Cushing or Gulf-coast crudes in such quantities as to affect their return abnormally, they are not representative. Data for these companies are shown (on the same basis as is used in Table 23) in Table 26, which follows:

TABLE 26.—TOTAL AVERAGE COST, AVERAGE VALUE, AND AVERAGE MARGIN PER GALLON OF GASOLINE PRODUCED, TREATING PRODUCTS OTHER THAN GASOLINE AS BY-PRODUCTS, FOR THREE REFINERIES WHICH PRODUCED NO CONSIDERABLE QUANTITY OF LUBRICATING OILS, SIX-MONTH PERIODS, 1915.

[All figures in cents per gallon.]

Item.	Company C.		Company D.		Gulf Refining Co.	
	Jan.–June.	July–Dec.	Jan.–June.	July–Dec.	Jan.–June.	July–Dec.
Average cost of crude oil and equivalent	1.25	2.25	1.31	2.24	2.17	2.55
Operating expenses and loss	.16	.29	.25	.46	.37	.36
General expenses	.16	.12	.48	.43	.10	.10
Refinery selling expense	.04	.03	.03	.03	.01	.01
Average cost of all products	1.61	2.69	2.07	3.16	2.65	3.02
Average net loss on products other than gasoline	1.82	4.08	2.07	4.68	3.68	9.92
Total cost per gallon of gasoline produced	3.43	6.77	4.14	7.84	6.33	12.94
Average net value per gallon of gasoline sold	5.98	8.54	5.42	8.22	7.92	10.36
Average margin per gallon of gasoline produced	2.55	1.77	1.28	.38	1.59	−2.58

The salient feature of the table is the large average net loss made by the three companies during the second six months on products other than gasoline, with the consequent decline in margin and the smallness of the margin. The loss on other products, when computed per gallon of gasoline produced, ran as high as 9.92 cents per gallon of gasoline in the case of the Gulf Refining Co. The large percentage of fuel oil and the absence of any important lubricating oil yield with these companies is a part of the explanation. Also the two Mid-Continent refiners shown in the table depended for profits on their products chiefly on sales in Standard of Indiana territory, where prices were abnormally low in the first three months of the second half-year period. Indeed, considering the fact that the Standard of Indiana's Sugar Creek plant showed relatively low margins, and both plants showed a relatively slight increase therein, these margins of the competing refiners are what might be expected. The Gulf company's situation has been commented upon on pages 71 and 90.

COSTS AND MARGINS PER GALLON OF GASOLINE PRODUCED; MONTHLY AVERAGE.—The preceding tables showing "costs" and margins per gallon of gasoline according to the "by-products method" have been based on six-month averages; and on that account do not show the movement of costs and margins by months. This is especially inadequate in the case of the situation in the marketing territory of the Standard of Indiana, where the extremes of high and low prices both come within the second six months of 1915. Accordingly data have been gathered to enable the presentation of the following table which shows for six refineries the movement by months of "costs," prices, and margins, from July to December, 1915. The average for the six months covered is identical with the figures shown in Table 23. The costs for six-month periods are more accurate than the monthly costs, as some adjustments are required in the computation of the figures by months. These do not, however, materially affect the trend of the results.

TABLE 27.—TOTAL AVERAGE COST, AVERAGE VALUE, AND AVERAGE MARGIN PER GALLON OF GASOLINE PRODUCED, TREATING PRODUCTS OTHER THAN GASOLINE AS BY-PRODUCTS, FOR SPECIFIED REFINERIES, BY MONTHS, JULY-DECEMBER, 1915.

[All figures in cents per gallon.]

Item.	Standard of Indiana, Whiting plant.						
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	July-Dec.
Average cost of crude oil and equivalent	2.42	2.60	3.23	3.43	3.43	3.89	3.18
Operating expenses and loss	.93	1.01	1.04	1.11	1.14	1.04	1.05
General expenses	.19	.19	.18	.18	.18	.18	.18
Refinery selling expenses	.13	.13	.12	.12	.12	.12	.13
Average cost of all products	3.67	3.93	4.57	4.84	4.87	5.23	4.54
Average net loss on products other than gasoline	[1] 1.28	[1] .84	[1] .12	[1] .26	[1] .23	.02	[1] .47
Average total cost per gallon of gasoline produced	2.39	3.09	4.45	4.58	4.64	5.25	4.07
Average net value per gallon of gasoline sold	6.72	6.89	7.41	8.57	10.04	11.84	8.27
Average margin per gallon of gasoline produced	4.33	3.80	2.96	3.99	5.40	6.59	4.20

[1] Gain.

TABLE 27.—TOTAL AVERAGE COST, AVERAGE VALUE, AND AVERAGE MARGIN PER GALLON OF GASOLINE PRODUCED, TREATING PRODUCTS OTHER THAN GASOLINE AS BY-PRODUCTS, FOR SPECIFIED REFINERIES, BY MONTHS, JULY-DECEMBER, 1915—Continued.

[All figures in cents per gallon.]

Item.	Standard of Indiana, Sugar Creek plant.						
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	July-Dec.
Average cost of crude oil and equivalent	2.12	2.23	2.82	3.07	3.06	3.17	2.74
Operating expenses and loss	.70	.62	.94	.87	.88	.88	.81
General expenses	.16	.14	.16	.14	.15	.17	.15
Refinery selling expenses	.06	.05	.06	.06	.06	.07	.06
Average cost of all products	3.04	3.04	3.98	4.14	4.15	4.29	3.76
Average net loss on products other than gasoline	1.35	2.54	2.84	3.08	2.10	1.65	2.23
Average total cost per gallon of gasoline produced	4.39	5.58	6.92	7.22	6.25	5.94	5.99
Average net value per gallon of gasoline sold	5.79	5.82	6.39	7.28	9.08	10.95	7.10
Average margin per gallon of gasoline produced	1.40	.24	—.43	.06	2.83	5.01	1.11

Item.	Standard of New York, Buffalo plant.						
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	July-Dec.
Cost of crude oil and equivalent	2.87	2.88	2.87	3.19	3.57	3.68	3.18
Operating expenses and loss	1.34	1.22	1.35	1.36	1.47	1.31	1.34
General expenses	.50	.45	.52	.49	.49	.45	.48
Refinery selling expenses	.06	.06	.07	.07	.07	.06	.07
Average cost of all products	4.77	4.61	4.81	5.11	5.60	5.50	5.07
Average net loss on products other than gasoline	.78	.58	1.52	1.60	1.81	1.77	1.47
Total cost per gallon of gasoline produced	5.55	5.19	6.33	6.71	7.41	7.27	6.54
Average net value per gallon of gasoline sold	8.03	8.98	10.59	11.29	12.20	13.72	10.25
Average margin per gallon of gasoline produced	2.48	3.79	4.26	4.58	4.79	6.45	3.71

TABLE 27.—TOTAL AVERAGE COST, AVERAGE VALUE, AND AVERAGE MARGIN PER GALLON OF GASOLINE PRODUCED, TREATING PRODUCTS OTHER THAN GASOLINE AS BY-PRODUCTS, FOR SPECIFIED REFINERIES, BY MONTHS, JULY-DECEMBER, 1915—Continued.

[All figures in cents per gallon.]

Item.	Atlantic Refining Co., Philadelphia plant.						
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	July-Dec.
Average cost of crude oil and equivalent	3.44	3.28	3.49	3.63	4.11	4.13	3.63
Operating expenses and loss	.81	.90	.86	1.14	1.19	1.35	1.02
General expenses	.25	.22	.24	.26	.29	.35	.26
Refinery selling expenses	.02	.02	.02	.02	.02	.03	.02
Average cost of all products	4.52	4.42	4.61	5.05	5.61	5.86	4.93
Average net loss on products sold other than gasoline	[1] 2.92	[1] .77	[1] 1.89	[1] .83	.96	.06	[1] 1.11
Average total cost per gallon of gasoline produced	1.60	3.65	2.72	4.22	6.57	5.92	3.82
Average net value per gallon of gasoline sold	8.18	9.00	9.63	11.21	11.88	13.50	10.29
Average margin per gallon of gasoline produced	6.58	5.35	6.91	6.99	5.31	7.58	6.47

Item.	Company A.						
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	July-Dec.
Cost of crude oil and equivalent	4.59	4.76	5.05	5.20	6.01	5.34	5.16
Operating expenses and loss	1.00	.98	.80	1.20	.95	1.12	1.00
General expenses	.26	.22	.22	.26	.24	.22	.24
Refinery selling expenses	.04	.03	.03	.03	.04	.03	.03
Average cost of all products	5.89	5.99	6.10	6.69	7.24	6.71	6.43
Average net loss on products other than gasoline	1.12	.16	.95	4.74	2.45	2.62	2.22
Total cost per gallon of gasoline produced	7.01	6.15	7.05	11.43	9.69	9.33	8.65
Average net value per gallon of gasoline sold	8.85	9.60	10.77	11.65	13.00	15.46	11.43
Average margin per gallon of gasoline produced	1.84	3.45	3.72	.22	3.31	6.13	2.78

Item.	Company B.						
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	July-Dec.
Cost of crude oil and equivalent	1.20	1.51	1.96	2.09	2.25	2.53	1.97
Operating expenses and loss	.45	.42	.42	.41	.41	.46	.43
General expenses	.25	.21	.24	.21	.24	.21	.22
Refinery selling expenses	.16	.12	.17	.16	.15	.14	.15
Average cost of all products	2.06	2.26	2.79	2.87	3.05	3.34	2.77
Average net loss on products other than gasoline	1.08	.90	3.34	2.26	2.94	3.76	2.46
Total cost per gallon of gasoline produced	3.14	3.16	6.13	5.13	5.54	7.10	5.23
Average net value per gallon of gasoline sold	5.82	5.91	6.72	8.42	9.47	10.73	8.13
Average margin per gallon of gasoline produced	2.68	2.75	.59	3.29	3.93	3.63	2.90

[1] Gain.

In general, the table shows that "costs," according to the by-products method, increased during the second half of 1915. In several cases the movement was somewhat irregular, however, chiefly on account of variations in losses and gains on other products. Excepting the Atlantic Refining Co., to which the by-products method of figuring gasoline "costs" here used is not strictly applicable, the increases in "costs" between July and December ranged from 1.55 cents to 3.96 cents per gallon.

At each of the six refineries covered, prices increased so much more rapidly than "costs" that margins were greater in December than in July by amounts ranging from 0.95 cent (Company B) to 4.29 cents (Company A). The December margin per gallon of gasoline was over 5 cents per gallon for five of the six refineries.

In the case of the three refineries which sold a large part of their products in the Standard of Indiana's marketing territory (the two plants of the Standard of Indiana and Company B), the fact that the margins were at a minimum in September is noteworthy (see pp. 69, 124). Indeed, the Sugar Creek refinery of the Standard of Indiana would have lost money had its business been limited to the quantities produced in this month and had these quantities been disposed of at the current prices.

Again it is to be observed that the method of charging all losses and gains to gasoline is not properly applicable to cases like the Atlantic Refining Co., in which there are other main products, such as lubricating oil. That this company's margins on gasoline were less than those shown in Table 27, and that instead of fluctuating they steadily increased during the last six months of 1915, are indicated in the following statement, in which gains from other products are not deducted from gasoline costs, or added to margins:

	July.	Aug.	Sept.	Oct.	Nov.	Dec.	July-Dec.
Average net value per gallon of gasoline sold..	8.18	9.00	9.63	11.21	11.88	13.50	10.29
Average cost of all products.....	4.52	4.42	4.61	5.05	5.61	5.86	4.93
Average margin per gallon of gasoline, gains on other products not added....	3.66	4.58	5.02	6.16	6.27	7.64	5.36

MARGINS PER GALLON OF GASOLINE SOLD.—The average margins shown in the preceding tables (tables 23–27) have been computed per gallon of gasoline produced, and do not correspond to the margins made on sales, or to the current net profits. Their value lies in showing what the margins would be with a given cost of production and price, and what would be the outcome if business were continued with such conditions of cost and price. Average margins per gallon of gasoline *sold* have also been computed. While not allowing for changes

in inventory, the margins per gallon sold do reflect to some extent the effect of the larger proportion of sales of gasoline in the second half of the year. The margins thus computed agree with those shown in the tables in general trend, showing a general increase during the year. They are, however, in most cases somewhat larger than the margins per gallon of gasoline produced, as the quantity of gasoline sold was greater than that produced in the second half of 1915.

Section 9. Monthly margins per gallon of crude oil.

The costs and margins dealt with up to this point have been per gallon of gasoline or per gallon of other products. They are based on product. Another way of treating costs and margins, however, is to consider the raw material from which the various joint products are derived as the basis of computation. Thus the sum of the cost of crude oil per gallon and the cost of all refinery operations per gallon of crude oil can be ascertained; and this cost can be compared with the price received for the combination of products derived from a gallon of crude oil.

It should be observed that most refineries consume from two and a half to five times as much crude oil as they produce gasoline. It follows that the costs and margins when computed on the basis of a gallon of crude oil are much less than those per gallon of gasoline. Thus, at the Standard of New York's Buffalo plant, the cost per gallon of gasoline was 5.55 cents (July) and the margin per gallon of gasoline 2.48 cents (see p. 92), while the same company's total refinery cost per gallon of crude used was only 2.88 cents (July) and its margin per gallon of crude .54 cent.

In the previous discussion of the relation between cost and price by months (see Tables 14–19, pp. 65–72) the cost figures used have been limited to cost of crude oil, and the comparison has been made between this cost and the value of about 95 per cent of products. Such a comparison is valuable for relative purposes, but it throws little light on the absolute amount of the margin at any given time. In order to supplement this discussion complete costs and prices have been secured from a group of representative refiners, and the margins shown in the next table are fairly close approximations to what the margins would have been if the products obtained from the operations covered by these costs had been sold at the current prices received by the several companies. In the case of the two Standard of Indiana plants figures are shown on two bases: (1) "Company margin," for the entire year, by months, on the basis of the average prices f. o. b. refinery for the three large plants operated by the Indiana company, and without including refinery marketing costs; (2) "Plant margin," for the last six months, on the basis of the prices actually received at each of the two plants, and including refinery marketing operations in costs. The same observation applies to the two columns shown

under Standard of Ohio. Obviously the statistics for the plant margins (see Table 28) are the more accurate in these cases.

In the following table the margins are based on average selling prices weighted by the actual percentages of the various products *produced*. The quantity produced differs from the quantity sold and is generally less than the latter in the second half of the year. The margins, as already stated, are what would have been the result if the quantity manufactured during each month had been sold during the month at the current price.

TABLE 28.—MONTHLY AVERAGE MARGIN BETWEEN TOTAL REFINERY COST PER GALLON OF CRUDE AND THE PRICE OF THE PRODUCTS, FROM A GALLON OF CRUDE, FOR REPRESENTATIVE STANDARD REFINERIES, 1915.[1]

[All margins in cents per gallon.]

Month.	Standard of New York, Buffalo plant.		Atlantic Refining Co., Philadelphia plant.		Standard of Ohio.			
	Per cent of products.	Margin.	Per cent of products.	Margin.	Per cent of products.	Company margin.	Per cent of products.	Plant margin.
January	100.0	0.52	100.0	1.34	94.3	−0.18	.....	.....
February	100.0	.35	100.0	1.16	93.8	− .22	.....	.....
March	100.0	.46	100.0	1.32	94.3	.06	.....	.....
April	100.0	.38	100.0	1.12	93.8	− .03	.....	.....
May	100.0	.38	100.0	1.61	92.3	.13	.....	.....
June	100.0	.52	100.0	1.12	94.2	− .20	.....	.....
July	100.0	.54	100.0	1.13	93.7	− .34	100.0	−0.51
August	100.0	.79	100.0	1.51	94.5	− .02	100.0	.06
September	100.0	.86	100.0	1.29	94.7	.04	100.0	.05
October	100.0	.65	100.0	1.47	94.3	.17	100.0	.10
November	100.0	.28	100.0	1.09	94.0	.73	100.0	.69
December	100.0	.63	100.0	1.59	93.8	.67	100.0	.63

Month.	Standard of Indiana.							
	Whiting plant.				Sugar Creek plant.			
	Per cent of products.	Company margin.[2]	Per cent of products.	Plant margin.	Per cent of products.	Company margin.[2]	Per cent of products.	Plant margin.
January	92.0	1.51	.....	.....	96.3	1.01	.....	.....
February	92.0	1.50	.....	.....	95.2	.81	.....	.....
March	88.6	1.80	.....	.....	96.1	1.35	.....	.....
April	93.9	1.57	.....	.....	97.8	1.54	.....	.....
May	90.0	1.69	.....	.....	97.5	1.12	.....	.....
June	88.6	1.51	.....	.....	96.7	1.32	.....	.....
July	88.4	1.50	100.0	1.19	97.5	1.09	100.0	0.47
August	92.4	1.25	100.0	.81	97.4	.85	100.0	.20
September	91.9	.88	100.0	.38	97.2	.49	100.0	− .12
October	91.4	1.37	100.0	.83	96.6	.77	100.0	.04
November	89.9	2.24	100.0	1.59	96.8	1.94	100.0	1.17
December	91.1	2.50	100.0	2.01	95.6	3.84	100.0	3.01

[1] For details see Statistical Exhibits, p. 221.

[2] Based on average sales for three plants with refinery selling cost excluded.

TABLE 29.—MONTHLY AVERAGE MARGINS BETWEEN TOTAL REFINERY COST PER GALLON OF CRUDE AND THE PRICE OF THE PRODUCTS, FROM A GALLON OF CRUDE, FOR REPRESENTATIVE "INDEPENDENT" REFINERIES, 1915.[1]

[All margins in cents per gallon.]

Month.	Company C.		Company E.		Company D.	
	Per cent of products.	Margin.	Per cent of products.	Margin.	Per cent of products.	Margin.
January	100.0	0.97	.....	.....	100.0	0.29
February	100.0	.78	.....	.....	99.5	.19
March	100.0	.93	.....	.....	99.4	.38
April	100.0	.95	.....	.....	100.0	.49
May	99.6	.58	100.0	0.68	100.0	.38
June	99.4	.54	100.0	.53	100.0	.11
July	99.8	.38	100.0	— .09	99.0	.28
August	99.9	.12	100.0	.48	95.9	— .25
September	99.9	.37	100.0	.18	96.3	— .12
October	100.0	.58	100.0	.38	96.4	.37
November	100.0	.82	100.0	.47	96.4	.45
December	100.0	1.10	100.0	.68	98.6	.66

Month.	Company B.		Gulf Refining Co.		Company A.	
	Per cent of products.	Margin.	Per cent of products.	Margin.	Per cent of products.	Margin.
January	100.0	—0.28	100.0	0.34	100.0	0.16
February	100.0	— .04	100.0	.61	100.0	— .37
March	100.0	.38	100.0	.73	100.0	.40
April	100.0	.37	100.0	.57	100.0	.77
May	100.0	.65	100.0	.95	100.0	.92
June	100.0	.50	100.0	.18	100.0	1.38
July	100.0	.55	100.0	— .05	100.0	.65
August	100.0	.35	100.0	— .51	100.0	1.02
September	100.0	.55	100.0	— .56	100.0	1.96
October	100.0	.83	100.0	.18	100.0	.87
November	100.0	.49	100.0	— .54	100.0	1.32
December	100.0	.87	100.0	— .76	100.0	1.44

[1] For details see Statistical Exhibits, p. 223.

Most of the 10 companies included in the tables show good margins per gallon of crude in 1915, and with but one exception showed an increased margin toward the end of the year. The chief exception in both cases is the Gulf Refining Co., which reflects the unfavorable conditions confronting the Gulf coast refiners. Most of the companies, too, with the exceptions of the first three and the last, show a very low margin in August or September, such companies being all refiners of Mid-Continent crude, and, with the exception of the Gulf Refining Co., all selling their products chiefly in the territory occupied by the Standard of Indiana. The minimum point with the eastern refiners

(Company A and Standard of New York) came in the first half of the year.

The Standard of Ohio and Standard of New York show irregular margins, and their margins did not increase uniformly. This condition was in part due to the fact that these companies during the second six months of 1915, when the price of crude oil was rising, were using crude secured under contracts with producers at less than the current market price at the time of refining. The two companies are largely marketing concerns and consequently their refinery costs have less significance than in other cases.

It will be observed that the average margin during the first six months was greater than that of the second six months in the case of three independent companies, C, D, and Gulf. Omitting the Gulf, these companies are independent refiners whose products are largely sold in Indiana "territory." The Standard of Indiana itself shows on this same basis a slightly higher average margin in the second six-month period, a fact which is the more notable on account of the smallness of its margin in September. It is apparent that this company after maintaining prices at a low level in August and part of September, raised them to such a degree that in December they were actually making an average margin of from 2.5 cents to 3.8 cents on every gallon of crude refined.

Indeed this company's refinery prices were notably out of line with its costs. Taking its Sugar Creek and Whiting refineries for example, and using the actual refinery sales at these plants, it appears that its total cost per gallon of crude (including refinery selling expense) and the weighted average price of the products secured from a gallon of crude, loss deducted, were as follows:

TABLE 30.—AVERAGE MONTHLY REFINERY COSTS PER GALLON OF CRUDE OIL CONSUMED AT THE SUGAR CREEK AND WHITING PLANTS OF THE STANDARD OF INDIANA, COMPARED WITH AVERAGE MONTHLY PRICES OF ALL PRODUCTS FROM A GALLON OF CRUDE, BY MONTHS, JULY-DECEMBER, 1915.

[All figures in cents per gallon.]

Month.	Sugar Creek plant.			Whiting plant.		
	Refinery cost per gallon of crude.	Weighted average price of all products.	Margin.	Refinery cost per gallon of crude.	Weighted average price of all products.	Margin.
July	2.87	3.34	0.47	3.39	4.58	1.19
August	2.87	3.07	.20	3.59	4.40	.81
September	3.65	3.53	— .12	4.17	4.55	.38
October	3.85	3.89	.04	4.39	5.22	.83
November	3.85	5.02	1.17	4.42	6.01	1.59
December	4.08	7.09	3.01	4.89	6.90	2.01

It is at once apparent that as costs held level in July and August, prices had been reduced so that the margin declined. More than this, between August and September, as the crude used increased in value and costs rose, prices of refined products were advanced so tardily that, on the basis of current cost of production and current prices, the Sugar Creek refinery shows a negative margin in September. The margin in October was also low.

The margins of the Standard refiners averaged over 1 cent per gallon of crude run throughout the year, excepting the figures shown for the Standard of Ohio and the Standard of New York. These figures for the Standard of New York, however, are for its Buffalo refinery only, and do not indicate the amount of margin on the company's entire refinery output. On the other hand, the average margin for the year of the independent companies shown was less than 1 cent per gallon.

Section 10. Summary concerning costs.

In most of the arguments made to the Commission in explanation of the advance of gasoline prices during 1915, the increase in cost of crude oil and other materials has been given an important place. Even in periods of great demand and relative scarcity, accompanied by rising prices, business men should use moderation in taking profits; and this seems especially true when the business is one that has generally been a very profitable one. It especially behooves a dominant group in any industry not to countenance or participate in the taking of any extreme advantage of temporary economic conditions. The test of moderation is to be found in a comparison of price with cost.

The facts concerning costs of gasoline and crude oil during 1915 have been found to be as follows:

1. When prices of gasoline were rising in the second half of 1915, the monthly average price of the combined products of a gallon of crude oil, in general, increased more than the cost to the refiners of a gallon of crude oil. (See Tables 14–19, pp. 65 to 72.)

2. The average specific cost (see p. 74) of a gallon of gasoline in the second half of 1915 (which does not allow for losses on other products) varied as between different refineries examined from a little over 2.5 cents to a little over 5.5 cents. In no case did this average cost increase between the two six-month periods by as much as 1 cent per gallon. All the seven refineries for which specific costs were secured showed increased margins between such costs and the average price of gasoline in the second six months as compared with the first six months of 1915. (See Tables 20 to 22, pp. 77 to 84.)

3. According to the by-products method (see p. 74), which charges all expenses to gasoline after deducting income from the sale of other products, all the eastern refineries [1] and a majority of the total number examined showed increased margins per gallon of gasoline produced [2] in the second half of 1915 (see Tables 23, 26, and 27, pp. 86 to 94). The increases in margin ranged from 0.62 cent to 2.65 cents. The cases in which the margin was smaller in the second six months were due to low prices in Indiana territory and unfavorable fuel oil contracts.

4. On the basis of crude oil used, figures for 10 companies, showing a comparison between all costs and price of all products, indicate increased margins per gallon, with certain exceptions, which are explained on grounds that emphasize the general rule. (See p. 97.)

5. The increases in margin show that the increase which took place in gasoline prices in the latter part of 1915 was generally greater than what was required by increased cost of production.

[1] The Atlantic Refining Co. shows an increase, when gains on other products are not deducted from costs.

[2] The margin per gallon produced was lower than the margin per gallon sold throughout most of the second half of the year (see p. 94).

CHAPTER IV.

EARNINGS, DIVIDENDS, AND QUOTATIONS ON THE STOCKS OF REPRESENTATIVE REFINING AND MARKETING COMPANIES.

Section 1. Earnings and dividends of representative companies.

A natural question which arises after the margin per gallon of crude oil or per gallon of gasoline has been computed is: What has been the result as reflected in the earnings and dividends? In answer to this question, the investments, earnings, and dividends of a considerable number of representative refining and marketing companies have been ascertained for the last three years. While it would be easy to exaggerate the degree of relationship between prices of products and the income of a corporation, these figures show that the increased margins received found ample expression in the income accounts and balance sheets.

There follows a table which shows for 1915 the investment (capital stock, funded debt, and surplus) at the beginning of the year, and the net earnings, dividends, and additions to surplus during the year for a number of representative refiners. The companies covered are 10 Standard companies which market gasoline by tank wagon; 6 small "independent" Pennsylvania refiners; 5 medium-sized "independent" Mid-Continent refiners; and the 2 big Gulf coast independent refiners. The Standard of Kansas, a purely refining company, is also included. In a majority of the cases, the figures have been checked against the books of the companies by the agents of the Commission.

The investment figures used are those found on the books of the companies and represent the capital employed in the business (capital stock, bonds, long-term notes, and surplus). In the absence of actual appraisals these figures are the best available.

TABLE 31.—CAPITAL, SURPLUS, NET EARNINGS, AND DIVIDENDS OF 24 REPRESENTATIVE REFINING AND MARKETING COMPANIES, ARRANGED ACCORDING TO OWNERSHIP AND CHARACTER OF CHIEF OPERATIONS, 1915.

Name of company.	Character of chief operations.**	Investment, including funded debt (first of year).	Net earnings and interest on funded debt.		Capital stock and surplus (first of year).	Dividends.		Additions to surplus.
			Amount.	Per cent on investment including funded debt.		Amount.	Per cent on capital stock and surplus.	
STANDARD COMPANIES.								
Refining and marketing companies.								
Atlantic Refining Co.	Refining and marketing.	$25,755,509	$5,592,425	21.7	$25,755,509	$1,000,000	3.9	$4,592,425
Standard of Indiana	do.	44,394,666	15,998,376	36.0	44,394,666	3,000,000	8.1	12,998,376
Standard of New Jersey	Producing,* refining, and marketing.	249,979,868	51,591,569	20.6	249,979,868	19,667,660	7.9	31,923,909
Standard of New York.	Refining and marketing.	90,471,958	14,464,263	16.0	90,471,958	6,000,000	6.6	8,464,263
Standard of Ohio	do.	8,953,697	2,136,256	23.9	8,953,697	840,000	9.4	1,296,256
Standard of Kansas	Refining.	3,144,423	563,946	17.9	3,144,423	240,000	7.6	323,946
Magnolia Petroleum Co.	Producing,* refining, and marketing.	[1] 15,667,308	[2] 2,217,228	14.2	[3] 7,097,308	852,011	12.0	813,811
Average of Standard refining companies.		62,623,918	13,223,437	21.1	61,399,033	4,599,953	7.5	8,644,009
Marketing companies.								
Continental Oil Co.	Marketing.	4,533,067	1,843,037	34.0	4,533,067	300,000	7.9	1,183,037
Standard of Nebraska	do.	1,496,793	561,914	37.5	1,496,793	200,000	13.4	361,914
Standard of Kentucky	do.	4,936,086	1,124,640	22.8	4,936,086	480,000	9.7	644,640
Average of Standard marketing companies		3,655,515	1,076,530	29.4	3,655,515	346,666	9.5	729,863
Standard of California	Producing, refining, and marketing.	90,227,638	9,529,945	10.6	90,227,638	4,968,665	5.5	4,561,280
Average of Standard group.		49,051,056	9,574,872	19.5	48,271,965	3,473,485	7.2	6,051,232

OTHER COMPANIES.								
Pennsylvania group.								
Company 1	Refining	198,070	6,607	3.3	198,070	.....	.....	6,607
Company 2	.....do	[4] 122,756	[5] 7,547	6.1	[4] 122,756	5,572	4.5	1,974
Company 3	.....do	302,264	16,961	5.6	302,264	10,000	3.3	6,961
Company 4 [34]	.....do	[6] 1,453,438	178,235	12.3	[6] 1,453,438	206,355	14.2	[7] 28,119
Company 5	Producing,* refining, and marketing	[8] 10,238,724	[9] 855,167	[10] 8.4	[8] 10,238,724	[11] 11,782	[12] .1	843,384
Company 6 [35]	Refining	400,906	293,840	73.3	400,906	[13] 250,768	62.6	43,072
Average of Pennsylvania independents		2,119,359	226,393	10.7	2,119,359	80,746	3.8	145,646
Mid-Continent group.								
Company 7	Producing and refining	[14] 2,152,572	[15] 1,091,185	[16] 50.7	[17] 1,877,572	128,915	[18] 6.9	[19] 1,382,697
Company 8	.....do	472,036	358,957	76.0	472,036	.....	.....	358,957
Company 9	.....do.*	351,044	65,872	18.8	351,044	13,999	4.0	[20] 76,873
Company 10	Producing, refining, and marketing	[21] 5,387,327	1,100,979	[37] 20.4	[21] 5,387,327	434,244	[22] 8.1	666,735
Company 11	Producing and refining	[23] 346,510	[24] 81,312	[25] 23.5	[23] 346,510	20,759	[26] 6.0	[27]
Average Mid-Continent independents		1,741,898	539,661	31.0	1,686,898	119,583	7.1	[28] 621,315

For foot notes see pp. 104–105.

TABLE 31.—CAPITAL, SURPLUS, NET EARNINGS, AND DIVIDENDS OF 24 REPRESENTATIVE REFINING AND MARKETING COMPANIES, ARRANGED ACCORDING TO OWNERSHIP AND CHARACTER OF CHIEF OPERATIONS, 1915—Continued.

Name of company.	Character of chief operations.**	Investment, including funded debt (first of year).	Net earnings and interest on funded debt.		Capital stock and surplus (first of year).	Dividends.		Additions to surplus.
			Amount.	Per cent on investment including funded debt.		Amount.	Per cent on capital stock and surplus.	
OTHER COMPANIES—continued.								
Mid-Continent-Gulf-coast group.								
Gulf Refining Co.	Producing,* refining, and marketing.	[29] 13,672,948	[30] 1,631,048	11.9	[29]13,122,948	.....	.....	1,608,881
The Texas Co.[26]	.....do.*	58,235,974	[31] 7,410,326	12.7	41,135,974	3,000,000	7.3	3,393,326
Average Mid-Continent-Gulf-coast independents.	.....	35,954,461	4,520,687	12.6	27,129,461	1,500,000	5.5	2,501,104
Average of independent group.	.....	7,179,582	1,007,541	14.0	5,800,736	314,030	5.4	[32] 696,779
Average, all companies.	.....	26,370,674	4,934,235	18.7	25,266,716	1,762,113	7.0	[33] 3,257,604

* Allied with subsidiary producing company.

** Several "independent" companies own pipe lines, either directly or through subsidiaries, and an important part of the stockholders of the Standard companies are also stockholders in pipe-line companies. Most of the independent refining companies own tank cars.

[1] Capital stock and bonds increased during the year by $4,229,275. One-half of same ($2,114,637) added to investment as of Dec. 31, 1914.

[2] Interest paid on bonds ($551,705) added back to earnings. Losses of $9,107 on "royalty and producers account," deducted from earnings.

[3] Capital stock increased during the year by $1,589,275. One half of same ($794,637) added to capital stock and surplus as of Dec. 31, 1914.

[4] Less $12,000 outside investments on which returns have been withheld from the earnings of the company.

[5] Includes $3,315 made on outside speculations.

[6] Includes $197,327 additions to surplus, on account of gain by reappraisal.

[7] Deduction.

[8] Includes $2,103,128 in outside investments on which but $6,250 returns were reported.

[9] All earning from outside investments (except $6,250) not reported to Dec. 31, 1915. (No doubt returns from these investments received in February, 1916. See note 11.)

[10] Based on investment of $8,135,596 (see note 8), net earnings equal 10.5 per cent.

[11] On preferred stock only. Does not include common stock dividend of $2,539,737 paid in February, 1916.

[12] Based on capital stock and surplus of $10,238,724 and dividends of $2,551,519 (see note 11), dividends equal 24.9 per cent.

[13] Includes $50,768 paid as excess salaries.

[14] As of Nov. 30, 1914. By the end of the year investments amounted to $5,137,089.

[15] Earnings for 13 months (Nov. 30, 1914–Dec. 31, 1915). Excludes $135,000 income from pipe line stocks on which no investment was reported on Nov. 30, 1914. Interest paid on bonds ($24,759) added back to earnings.

[16] Based on investment of $5,137,089 (see note 14) and earnings of $1,226,185 (see note 15), net earnings on investment equal 23.9 per cent.

[17] As of Nov. 30, 1914. By the end of the year 1915, capital stock and surplus amounted to $5,110,829.

[18] Based on capital stock and surplus of $5,110,829 (see note 17), dividends equal 2.5 per cent.

[19] Includes $310,186 on account of premium on capital stock and donated stock.

[20] Includes $25,000 account increased book value of stocks of a subsidiary producing company.

[21] Good will of $2,922,820 deducted.

[22] Exclusive of good will (see note 21). Based on capital stock and surplus including good will ($8,310,148), dividends equal 5.2 per cent.

[23] In May, 1915, company reorganized. Investment at end of year amounted to $957,628, of which bonds amounted to $200,000.

[24] Interest paid on bonds, $8,000 not added back to earnings (no bonds issued until after reorganization).

[25] Based on investment of $957,628 (see note 23) and earnings of $89,312 (see note 24), net earnings on investment equal 9.3 per cent.

[26] Based on capital stock and surplus (less good will) of $372,794 (see note 23), dividends equal 5.6 per cent.

[27] Satisfactory figures not available.

[28] Average for 4 companies.

[29] Includes $8,212,395 (average 1914–15) loan from the Gulf Pipe Line Co. and the Gulf Oil Corporation, on which no interest was paid. (These loans, which are drawn from related companies, are part of the capital of the Gulf Refining Co.)

[30] Interest paid on bonds ($22,166) added back to earnings.

[31] Interest paid on bonds and serial notes ($1,017,000) added back to earnings.

[32] Average for 12 companies.

[33] Average for 23 companies.

[34] For year ended October 31, 1915.

[35] For year ended May 1, 1916.

[36] For year ended June 30, 1915.

[37] Exclusive of good will (see note 21). If good will ($8,310,148) is included in investment, net earnings on investment equal 13.2 per cent.

This table shows the net earnings of the groups of refiners during 1915, ranging between 10.7 per cent and 29.4 per cent on the investment or capital employed in the business. The average for all was 18.7 per cent.

It will be noted that the companies included in the foregoing table are of all sorts: There are companies which do nothing but refine crude oil, and others which confine their operations to the marketing of refined products. Some own oil wells and pipe lines; others do not. Companies of all sizes, operating in all parts of the country, and using all kinds of crude, are covered in the table. For facilitating comparison, the various Standard companies have been grouped together, the pure marketing companies being shown segregated; but the Standard of California operates under such different conditions from the others that it is not combined with the Standard refining companies. The 13 "other companies" have been divided into groups on the basis of the kind of crude used.

INVESTMENT.—In the first column of figures is shown the total investment of each company, including funded debt. Only four[1] of the 24 companies tabulated, however, had bonds outstanding. The amount of the investment ranged from $122,756 for Company 2 up to $249,979,868 for the Standard of New Jersey. The Texas Co., with a capital and surplus of $58,235,974, had the largest investment of any "independent."[2] The great bulk of the investment in each case was in the company's own plant and equipment, excepting two or three cases such as the Standard of New Jersey. Of its total of nearly $250,000,000, $151,641,568 represents investments in other companies. Of the $10,238,724 investment of Company 5, also, $2,103,128 were invested in capital stock of other companies.

NET EARNINGS.—In the next two columns appear the net earnings (including any interest paid on funded debt), and the percentage of such earnings on the total investment. Of course, it is only for those companies which had bonds or long-term notes outstanding that interest had to be added back in order to get a figure showing total net earnings on total investment. A number of companies, because of the unusually large earnings during the year, in 1915 set aside considerable sums for various reserves, reducing thereby the true earnings shown for the year. No attempt has been made at a critical analysis of such reserves for the purpose of restoring them wholly or in part to surplus.

In two instances, namely, The Texas Company and Company 4, the earnings shown were as of June 30, 1915, and October 31, 1915, respectively. Inasmuch as the returns during the remainder of the

[1] Magnolia, $8,570,000 (average for 1915); Company 7, $275,000; Gulf, $550,000; Texas, $17,100,000.

[2] The Gulf Refining Co., however, is a subsidiary of the Gulf Oil Corporation, with a very large investment.

year were very favorable in the industry as a whole, these companies would, no doubt, show a higher return on investment during 1915 than that shown in the table.[1] On the other hand the figures as shown for Company 6 were as of May 1, 1916. The amount of net earnings ranged from $6,607 of Company 1 up to $51,591,569 of the Standard of New Jersey; and the rate on investment, from 3.3 per cent (Company 1) up to 76 per cent (Company 8). Other notably high rates were as follows: Company 6, 73.3 per cent; Company 7, 50.7 per cent; Standard of Nebraska, 37.5 per cent; Standard of Indiana, 36 per cent; and Continental Oil Co., 34 per cent.

The three highest rates of net earnings were made by "independent" companies. The reason for such high returns in the case of Company 7 and Company 8 is to be found in the ownership of crude-oil production; while the efficiency of Company 6 in marketing specialties explains its case.

Two of the three highest earnings relatively to investment on the part of Standard companies were made by pure marketing concerns; and the third, the Standard of Indiana, was not a crude oil-producing concern. Of the $15,998,376 net earnings of the Indiana company, $11,976,285 were from the refining department, and $4,022,091 were from the marketing department and outside investments.

As a general rule, it is worthy of note that the independents throve only when associated with production of crude oil; the Standard companies making the highest returns were, as companies, not associated with producing properties.

DIVIDENDS AND SURPLUS.—In but few cases was anything like the entire amount of net earnings paid in dividends. This is emphasized by the large sums added to surplus during the year. The rates of dividends are based on investment, not on capital stock. The Standard companies being undercapitalized, the rates actually paid on stock were higher than the rates on investment. The rate of dividends paid on investment varied considerably, ranging from nothing up to as high as 62.6 per cent in the case of Company 6. The average rate was 7 per cent. In the case of the three Standard marketing concerns, the average dividend was 9.5 per cent, the Standard of Nebraska actually paying 13.4 per cent. On the other hand, the small Pennsylvania refiners—except Company 6—made but a poor showing, especially in view of the fact that the 14.2 per cent of Company 4 made it necessary to draw upon its surplus.

Indeed, the additions to surplus made during 1915 have to be considered carefully in judging the profitableness of the refiners' operations. Thus, the Atlantic Refining Co. only paid 3.9 per cent on its

[1] It is reported that The Texas Co. showed for the year ended June 30, 1916, net earnings of nearly $14,000,000, or nearly 40 per cent on the $37,000,000 outstanding stock.

investment as of the beginning of the year, but over 80 per cent of its net earnings went into surplus. Much the same were the cases of Company 1, Company 5, Company 7, Company 8, Company 9, and the Gulf Refining Co. In two of the cases in which no dividends were paid, net earnings were good but were put into surplus.

The conclusion must be that the year 1915 was a very prosperous one for all classes of refiners, with the exception of a few of the small Pennsylvania companies. The investigation of costs, which showed increased margins per gallon in spite of rising expenses, is amply substantiated by the income accounts and balance sheets.

NET EARNINGS AND DIVIDENDS, 1913–1915.—The high returns made by the manufacturers and jobbers of gasoline in 1915 were not exceptional nor a compensation for preceding lean years. The facts concerning earnings and dividends are summarized for 1913–1915 in the following table:

TABLE 32.—PER CENT OF NET EARNINGS ON INVESTMENT AND OF DIVIDENDS ON CAPITAL STOCK AND SURPLUS FOR 24 REPRESENTATIVE REFINING AND MARKETING COMPANIES, 1913–1915.

Name of company.	Character of operations.**	Per cent of net earnings (including interest on funded debt) on investment (including funded debt).			Per cent of dividends on capital stock and surplus.		
		1913	1914	1915	1913	1914	1915
Atlantic Refining Co	Refining and marketing.	16.4	[1] 3.7	21.7	.....	0.9	3.9
Standard of Indiana	.....do.....	36.5	14.5	36.0	23.9	16.6	8.1
Standard of New Jersey	Producing,* refining, and marketing.	9.7	7.8	20.6	20.9	7.9	7.9
Standard of New York	Refining and marketing.	21.2	8.1	16.0	1.2	6.7	6.6
Standard of Ohio	.....do.....	23.4	13.8	23.9	9.3	9.8	9.4
Standard of Kansas	Refining.....	91.6	1.0	17.9	30.2	7.7	7.6
Magnolia Petroleum Co	Producing,* refining, and marketing.	19.2	16.5	14.2	.....	4.8	12.0
Continental Oil Co	Marketing.....	41.3	24.9	34.0	6.2	9.2	7.9
Standard of Nebraska	.....do.....	30.4	29.9	37.5	38.9	15.3	13.4
Standard of Kentucky	.....do.....	26.4	15.0	22.8	2.6	10.0	9.7
Standard of California	Producing, refining, and marketing.	16.8	12.5	10.6	6.9	6.0	5.5
Company 1 [2]	Refining.....	1.6	[1] 7.8	3.3	.....	.....	.....
Company 2 [2]	.....do.....	[1] 4.8	[1] 6.7	6.1	9.8	4.1	4.5
Company 3 [2]	.....do.....	4.4	[1] 3.1	5.6	1.0	1.9	3.3
Company 4 [2]	.....do.....	35.3	13.3	12.3	.....	10.5	14.2
Company 5	Producing,* refining, and marketing.	4.2	.7	8.4	8.2	4.4	[3] 1
Company 6	Refining.....	24.7	26.5	73.3	25.2	26.9	62.6

*Allied with subsidiary producing company.

**Several "independent" companies own pipe lines, either directly or through subsidiaries, and an important part of the stockholders of the Standard companies are also stockholders in the pipe-line companies. Most of the indpendent refining companies own tank cars.

[1] Loss.

[2] Small concerns with unsatisfactory books of accounts.

[3] Dividends of $2,539,737 on common stock paid Feb. 26, 1916, not included.

TABLE 32.—PER CENT OF NET EARNINGS ON INVESTMENT AND OF DIVIDENDS ON CAPITAL STOCK AND SURPLUS FOR 24 REPRESENTATIVE REFINING AND MARKETING COMPANIES, 1913–1915—Continued.

Name of company.	Character of operations.**	Per cent of net earnings (including interest on funded debt) on investment (including funded debt).			Per cent of dividends on capital stock and surplus.		
		1913	1914	1915	1913	1914	1915
Company 7	Producing and refining	.....	30.6	[1] 50.7	.....	1.6	6.9
Company 8	....do	30.0	[2] 29.4	76.0	.....	.....	.....
Company 9	....do*	8.7	6.9	18.8	.....	.....	4.0
Company 10	Producing, refining, and marketing.	15.2 [3] 24.9	5.2 [3] 8.0	13.2 [3] 20.4	6.3 [3] 10.3	5.9 [3] 9.1	5.2 [3] 8.1
Company 11[4]	Producing and refining	120.2	[2] 21.6	23.5	11.7	11.2	6.0
Gulf Refining Co	Producing,* refining, and marketing.	.....	15.5	11.9	.....	.....	.....
The Texas Company	....do*	17.1	13.3	12.7	5.5	6.8	7.3

* Allied with subsidiary producing company.

** From p. 108.

[1] Based on earnings for 13 months.

[2] Loss.

[3] Excluding good will from capital and surplus.

[4] On account of reorganization in May, 1915, it is difficult to make satisfactory analysis of the accounts for that year.

In 1914, 18 out of the 24 companies showed net earnings ranging from 1 per cent up to 30 per cent. Six out of the 24 companies showed losses. Four of the 6, however, paid dividends, 2[1] paying at a good rate. More than this, of the 6 companies showing a loss, 3[2] showed such high net earnings in the preceding and following year that the average for the three years would be very high; the other 3 were small and weak companies.

In 1913, all but one of the companies for which returns were available showed net earnings, ranging from 1.6 per cent up to 120.2 per cent. The year was nearly if not quite as good a one as 1915.

The high and relatively steady returns secured by the three Standard marketing companies, the Standard of Nebraska, Standard of Kentucky, and Continental Oil Co., is noteworthy. Also the fact that the Standard of Ohio, which bought nearly 38,000,000 gallons of gasoline from the Standard of Indiana, shows the same condition.

Another notable point is the large earnings made by two classes of "independent" refiners: (1) Mid-Continent refiners owning oil-producing properties (Company 7, Company 11, and Company 8); (2) Pennsylvania refiners producing successful specialties in the shape of lubricants (Companies 4 and 6).

The unsatisfactory condition of a large number of small eastern refiners is also indicated by the low returns received by several throughout the period.

[1] Company 11; Company 2.

[2] Atlantic Refining Co.; Company 8; Company 11.

On the whole the conclusion is that the refining business has been generally profitable. All the several Standard companies and some independents show a high average return for the three years covered by the table.

Section 2. Quotations of the stocks of refining and marketing companies.

As additional evidence bearing upon the relative profitableness of various refining and marketing companies in 1915, the Commission has compiled the quotations of the common stock of those companies whose stock is dealt in on exchanges or curbs and whose quotations are published by the leading financial papers. The period covered extends from 1911 to March, 1916. Needless to say quotations do not as a rule rise for a considerable period of time unless there is an improvement with respect to earnings.

Seven Standard companies are included: The Kentucky company was purely a marketing concern, the Kansas company was purely a refining concern, and the others combined refining and marketing operations. Of these others, the New York, Ohio, and Indiana companies owned no oil-producing properties, but the Standard of New Jersey owned practically all the stock of a large producer, the Carter Oil Co., and the California company owned production. The New York and New Jersey companies are the only large exporters. Thus, the different stages of the petroleum industry are all represented, but are combined in different degrees. In each case the movements of stock quotations, however, show the same general trend. The quotations of the Kentucky company, a jobber, run parallel to those of the Kansas company, a refiner. And the exporting, oil-well controlling New Jersey company's prices moved like those of the domestic Ohio company, which bought all its crude.

All the quotations moved upward during 1915. Though some declined during the early part of the year, beginning with August, or the last week in July, the upward trend was sharp. The Standard of New York is the only exception, its rise being relatively small. July was the month in which prices began to advance, and Mid-Continent crude began to go up on August 2. In the opinion of those who buy and sell securities the Standard companies were put in a favorable position by the relation existing between cost of crude and the price of their chief product, gasoline.

Taking each company separately, the stock quotations generally rose markedly from the date of dissolution until the early part of 1914. From that time until the middle of 1915 there was generally a decline, though small, in comparison with the previous rise. Then, as already stated, there was generally a pronounced rise until the end of the year.

Quotations were compiled to show the relative movement of the prices of common stock of five "independent" refining companies. The Texas Co. is a large producing, refining, and marketing company, operating on Mid-Continent and Gulf coast crudes, and marketing its products chiefly in the southern and eastern sections of the United States. Cosden & Co. were producers and refiners, operating in Oklahoma on Mid-Continent crude, and selling most of their product f. o. b. the refinery. The Sapulpa Refining Co. was an Oklahoma refiner. The Pure Oil Co. was an eastern refiner and marketer, with oil-producing interests. It used both Appalachian and Mid-Continent crude. The Midwest Refining Co., at Casper, Wyo., operated on Wyoming crude, selling its products f. o. b. the refinery. Quotations for this company, however, were not available for 1915.

In each case the price was higher at the end of 1915 than at the beginning, this being especially notable in the cases of The Texas Co., the Sapulpa Refining Co., and Cosden & Co. Also, this upward movement began about August, or about the time that crude oil advanced in price. Cosden & Co., however, is an exception.

This increase after August is doubtless connected with the fact that the Cosden and Texas companies were producers of crude oil; but on a rising crude market these prominent refining companies appear to have enjoyed increasing prosperity. In this no difference appears between the Standard companies and the leading "independents."

CHAPTER V.

INEQUALITIES IN COMPETITION AND PRICE.

GENERAL SURVEY OF INEQUALITIES.

The inequalities in prices of gasoline which are discussed in this chapter are those which relate to the question of the general advance in the price of gasoline in 1915. The attention of the Commission has been called to, and in its investigation it has noted, numerous cases of inequalities in the prices made by both Standard and other companies in different localities. The question raised in such cases pertains primarily not to the general advance of gasoline prices in 1915 but to the fact whether there has been price discrimination within the meaning of section 2 of the Clayton Act. This aspect of price inequalities is not discussed in this report, but is receiving further investigation by the Commission.

Two closely interwoven facts are established by the Commission's investigation: First, that numerous inequalities as between Standard marketing territories existed in gasoline prices during 1915; second, that there was little, if any, competition among the various former subsidiaries of the old Standard holding company in the marketing of gasoline. The two facts are interwoven, for, as will become apparent, if effective competition existed, no such extreme inequalities in price as there are would be found.

Section 1. Comparison of prices in the various Standard marketing territories.

DIFFERENCES NOT REQUIRED BY GENERAL DEMAND AND SUPPLY CONDITIONS.—Obviously, some differences in prices in different sections of the country are to be expected. Refiners near the oil fields and selling to points in their vicinity should, under competition, sell at lower prices than those whose crude costs more or who sell to remote points. Difference in volume of sales which affects costs is another legitimate ground for difference in price. The differences here referred to as inequalities, however, are not of this character. Rather, they exist after freight has been deducted and differences in marketing costs allowed for. They are, in short, differences in price not based upon differences in cost, whether of raw materials, refinery operation, or marketing. In the tables which support the diagrams, presented in the Statistical Exhibits, part II, the cost of the crude oil to the different

refineries is shown; and in the chapter on costs (Chapter III) the complete costs for some of the refineries whose prices are compared are shown.

Neither do the inequalities in price correspond to differences in demand and supply. It is a reasonable assumption that the demand for gasoline is not greater in New England than in Pennsylvania or in New Jersey territory; and the same observation applies to Louisiana territory as compared with Magnolia company territory (Texas and Oklahoma). Considerable differences in price, however, existed among these territories. Nor are the two low-priced areas, Indiana territory and the Pacific Coast States, notable for low demand.

Statistics in the Commission's possession show that the relation between stocks and sales of gasoline in the various marketing territories was such that the Standard of New Jersey and Atlantic Refining Co. might have been expected to get higher prices at the end of the year, 1915. On the other hand, increasing stocks and decreasing sales should have kept prices from rising to so great an extent in Indiana and Ohio territories, though in the case of Ohio some uncertainty as to ability to secure stocks in the future at as reasonable rates as in the past must be considered. Yet prices rose in all these territories. In view of the different demand and supply conditions in the territories mentioned, the general advance in all is not to be accounted for by conditions that prevailed in each and all the territories. If, on the other hand, it were sought to explain the general advance in November and December by the general condition of the market throughout the country, the fact of the great inequality of advance as between the different territories would remain—to say nothing of the fact that conditions in general did not require such a great advance.

In Ohio territory, for example, stocks increased throughout the year. As sales fell off during October, November, and December, the supply situation was most favorable in the last three months. In so far as these important demand and supply factors govern, therefore, an advance in the price of gasoline during those months in Ohio does not appear to have been necessary. From June to September, 1915, prices were lowest in Indiana territory, yet in those months the stocks of gasoline of the Standard of Indiana were decreasing rapidly and the quantity sold was increasing as fast. Diagram 11 (p. 58), if the maximum sales were placed in September instead of August, would be a fairly accurate picture of the Indiana company's situation.

COMPARISON OF PRICE MOVEMENTS AT REPRESENTATIVE POINTS.—The following diagrams (Diagrams 1–4, 13–23), are introduced for the purpose of showing the relative movement of prices in the various marketing territories. In order to show actual prices as of exact

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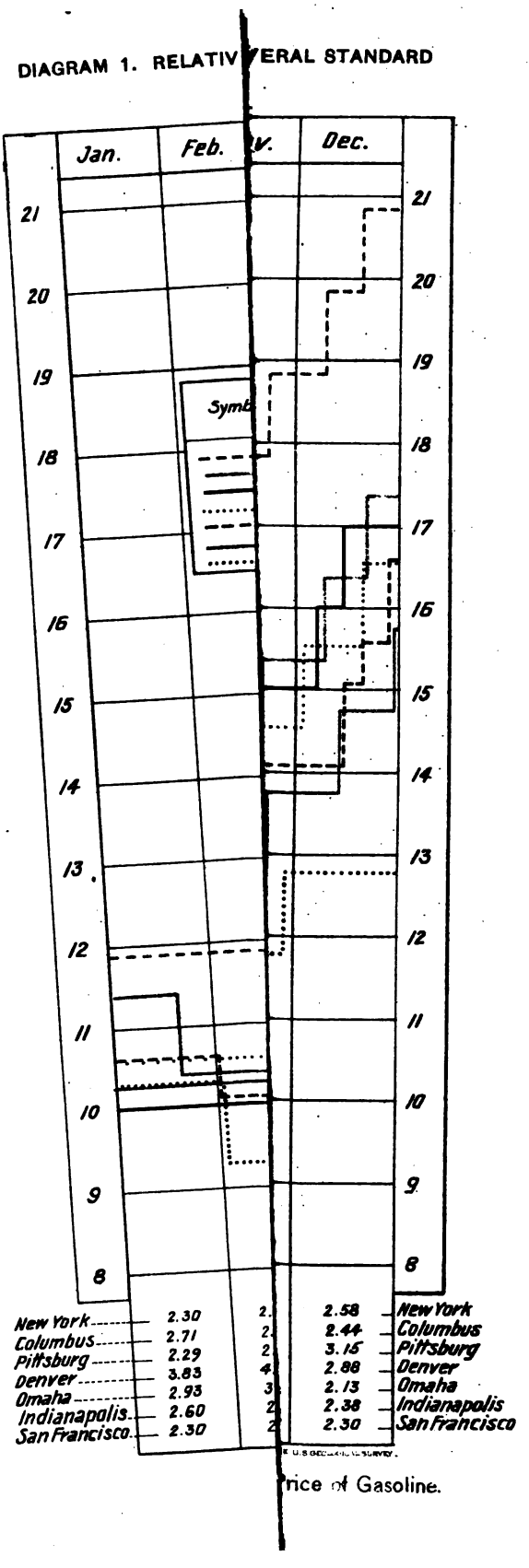

rice of Gasoline.

dates, the comparisons are made between specified towns. As prices varied but little within single territories, the towns will be found to represent large areas, and other towns might as well have been used. In several cases points have been chosen because of their nearness to one another, which serves to bring out the fact that the difference in price comes when an imaginary line bounding a Standard marketing territory is crossed.

It should be observed that the light dotted lines represent discounts made on purchases of large quantities, and, as most of the business in some territories came to be done on this basis, such lines are the ones used in making comparisons.

At the outset it will be illuminating to study the accompanying diagram (Diagram 1), which may be taken as a sort of cross section of the movement of gasoline prices in different parts of the country during 1915. It shows the dates and amounts of changes in the tank-wagon prices of gasoline at seven different cities from San Francisco to New York, with freight rates deducted. Supporting this diagram, as well as others herein presented, there will be found in the Statistical Exhibits, page 169f, complete data for a fair comparison—competitors, gravity of gasoline, chief refinery cost (crude oil), etc. Marketing costs for each point are shown by the figures just below the curves. Perhaps the most noticeable feature of the chart is the spreading apart of the price curves toward the end of the year. While at the beginning the prices all fell within a range of 2 cents, at the end of December they diverged to the extent of over 8 cents. In June the spread became nearly 3.5 cents, and in that month the lowest price (freight deducted) was reached, 8.6 cents at Denver in the Continental Oil Co.'s territory. The shifting and irregular movement of the prices relatively to one another is clear from the fact that the curves cross so frequently. The Denver curve, just referred to, starts in January above the Pittsburgh curve and the fourth highest; on June 30 it is the lowest of all; on December 31 it is fourth from the top, the Pittsburgh curve being higher. The relative flatness of the San Francisco curve and its lowness in December are noticeable.

The most important inequality is found between the territory of the Standard of Indiana and the other Standard marketing territories. Prices were lower and rose later in Indiana territory than in territories to the east and south. The fact is that, with the exception of the Pacific coast, taking the year as a whole, prices were lower in Indiana territory than in any other section; and this is true, even when allowance is made for difference in freight.

On the east of the Indiana territory lies the Ohio company's field, limited to the State of Ohio. Here the monthly average tank-wagon price after deducting freight varied from 10.96 cents in January to 9.90

cents in July, and to 16.48 cents in December;[1] while in the Indiana company's territory in the State of Illinois it was only 10.72 cents, 8.99 cents, and 14.67 cents in the same three months. A good idea of the relative level of prices and the movement therein can be secured from Diagram 13, facing this page. This shows that prices in Ohio were generally between 1.25 and 2.25 cents higher than in Indiana during the latter part of 1915, freight having been allowed for.

On the west of the Indiana company's territory lies the territory of the Continental Oil Co., the Standard marketing concern that sells gasoline products in the Rocky Mountain section. Here the monthly average tank-wagon price, minus freight, was 12.49 in January, 10.26 in July, and 17.34 in December. These figures are higher than the Indiana company's average prices in Illinois by from 1.27 to 2.57 cents. The diagram (Diagram 1), showing price curves for Denver, Colo., and Indianapolis, Ind., shows a difference of approximately 1.75 cents during 1915 after deducting freight.

The Denver price, however, was lower than the average for Colorado or for the Continental territory, especially in the first half of the year. The monthly average tank-wagon prices, minus freight, differed between the two territories by amounts varying from 2.01 cents to 3.19 cents. (See Table 34, Statistical Exhibits, p. 200.)

The Standard of Nebraska is a marketing concern purchasing nearly three-fourths of its gasoline from the Standard of Indiana. Its prices ran nearly parallel to Indiana prices, though a little higher. The accompanying diagram (Diagram 14) shows the movement of prices at Omaha, Nebr., and Council Bluffs, Iowa, just across the river from Omaha. The Nebraska price was about 1.5 cents higher in August, and at one point in November; and was actually over 2 cents higher on the two days, December 28 and 29.

South of the territory occupied by the Standard of Indiana lies the Standard of Louisiana. Taking Arkansas, a State in which the Standard of Louisiana and the Magnolia Petroleum Co. both do business, it appears that the average tank-wagon price, freight deducted, was: January, 10.83 cents; July, 10.69 cents; and December, 17.51 cents. The December average was nearly 3 cents above the Illinois average—a State which may be taken as representing Indiana territory. The Arkansas price excluding freight and allowing for discounts was from 3 to 4.5 cents higher than the Illinois price in several months between June and November.

Attention is also directed to the diagram (Diagram 15) showing the relative price levels in Nashville, Tenn., and Waterloo, Iowa, these

[1] These figures are based on shipments from the Cleveland refinery. Taking as the base the Standard of Indiana's Woodriver refinery, which furnished a large part of the gasoline sold in Ohio, the figures would be 10.45, 9.39, and 15.97 cents, respectively, while figures based upon Lima, Ohio, would be 10.98, 9.93, and 16.50 cents.

DIAGRAM 13. RELATIVE MOVEMENT OF TANK-WAGON PRICES, FREIGHT DEDUCTED. MADE BY SPECIFIED COMPANIES AT SPECIFIED POINTS, 1915.

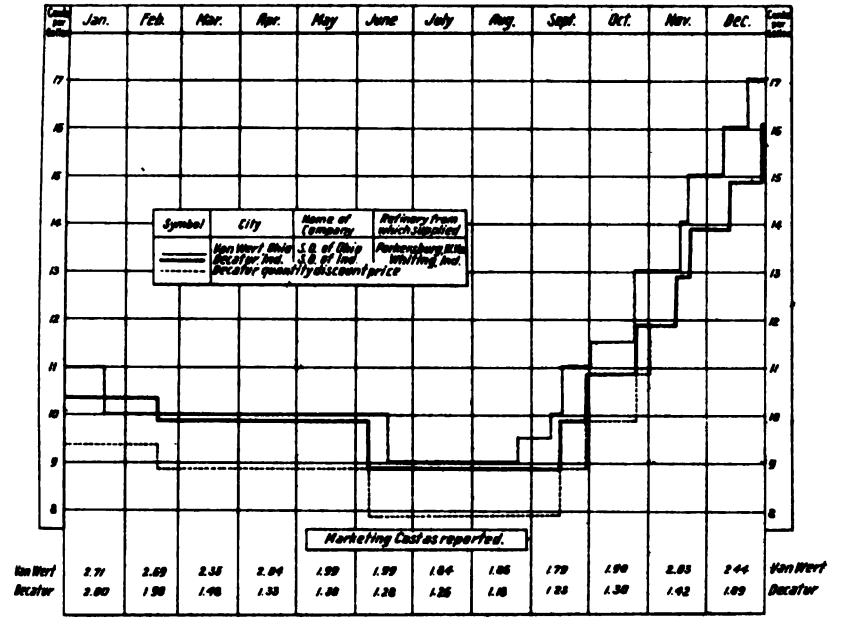

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DIAGRAM 14. RELATIVE MOVEMENT OF TANK-WAGON PRICES, FREIGHT DEDUCTED. MADE BY SPECIFIED COMPANIES AT SPECIFIED POINTS, 1915.

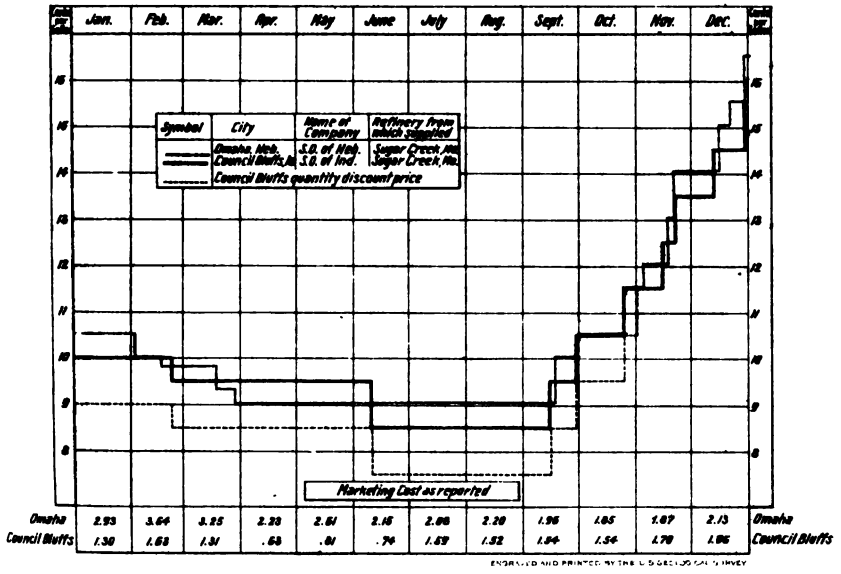

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DIAGRAM 15. RELATIVE MOVEMENT OF TANK-WAGON PRICES, FREIGHT DEDUCTED, MADE BY SPECIFIED COMPANIES AT SPECIFIED POINTS, 1915.

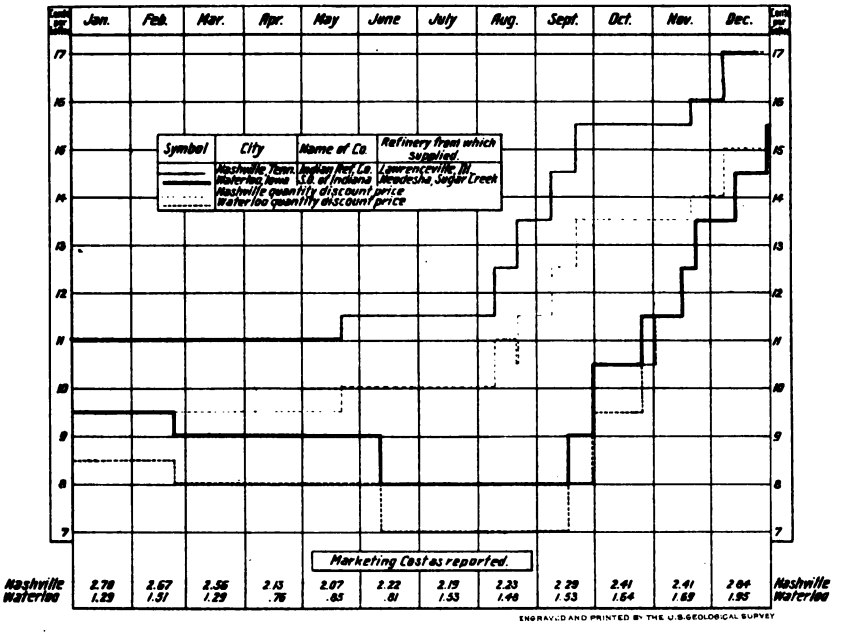

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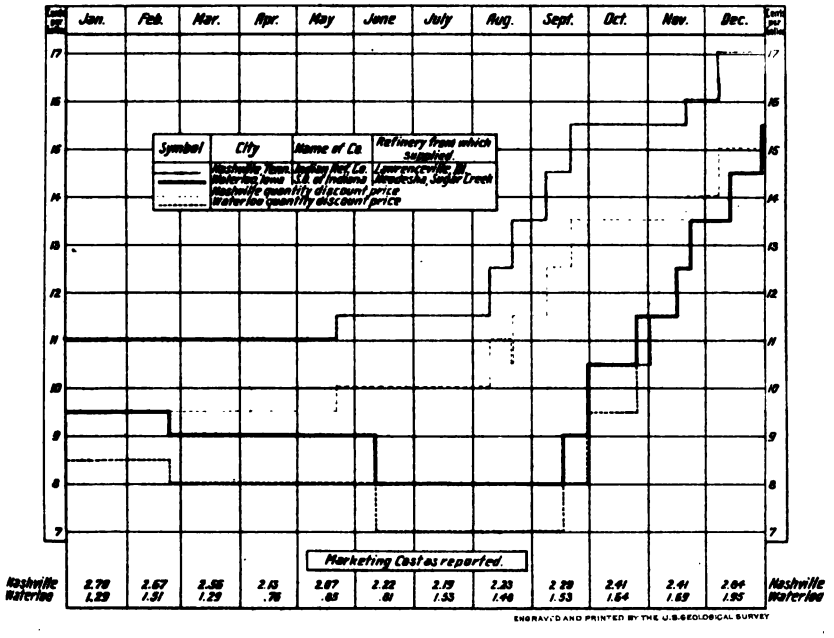
DIAGRAM 15. RELATIVE MOVEMENT OF TANK-WAGON PRICES, FREIGHT DEDUCTED, MADE BY SPECIFIED COMPANIES AT SPECIFIED POINTS, 1915.



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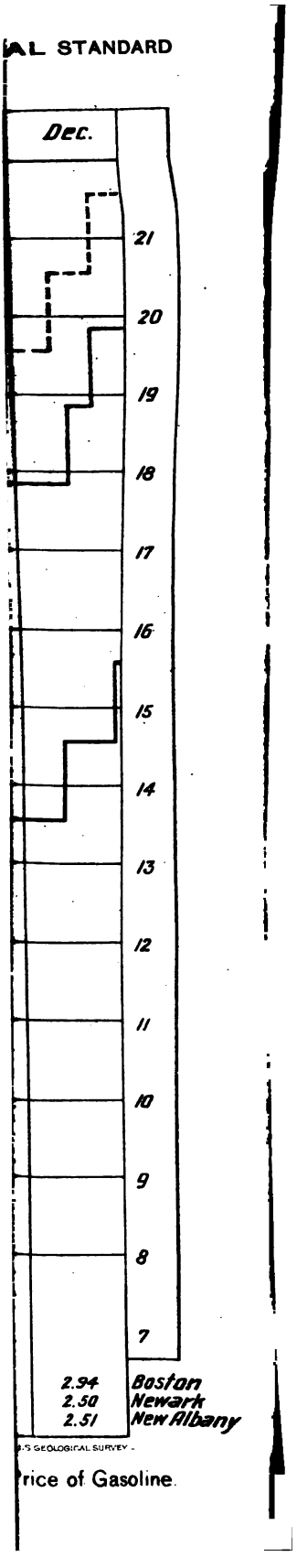

rice of Gasoline.

DIAGRAM 16. RELATIVE MOVEMENT OF TANK-WAGON PRICES, FREIGHT DEDUCTED, MADE BY SPECIFIED COMPANIES AT SPECIFIED POINTS, 1915.

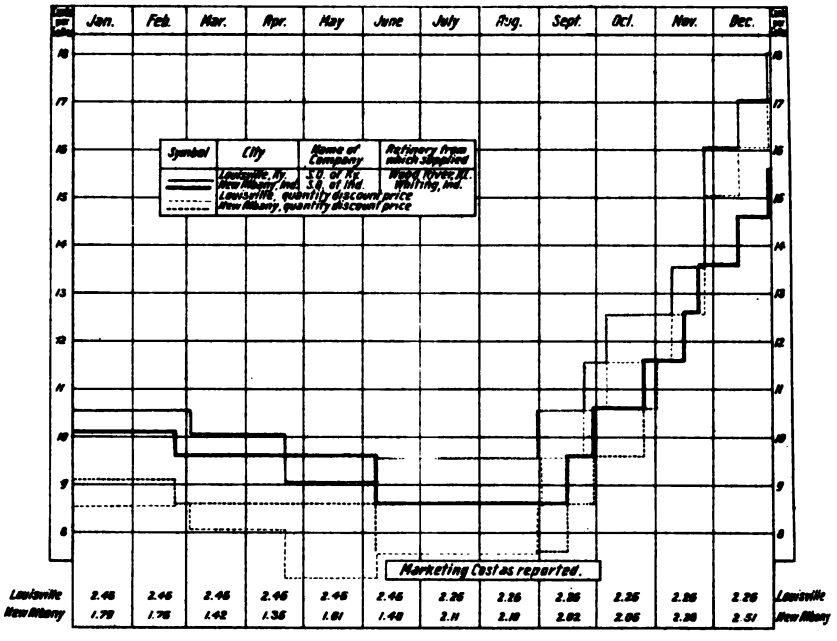

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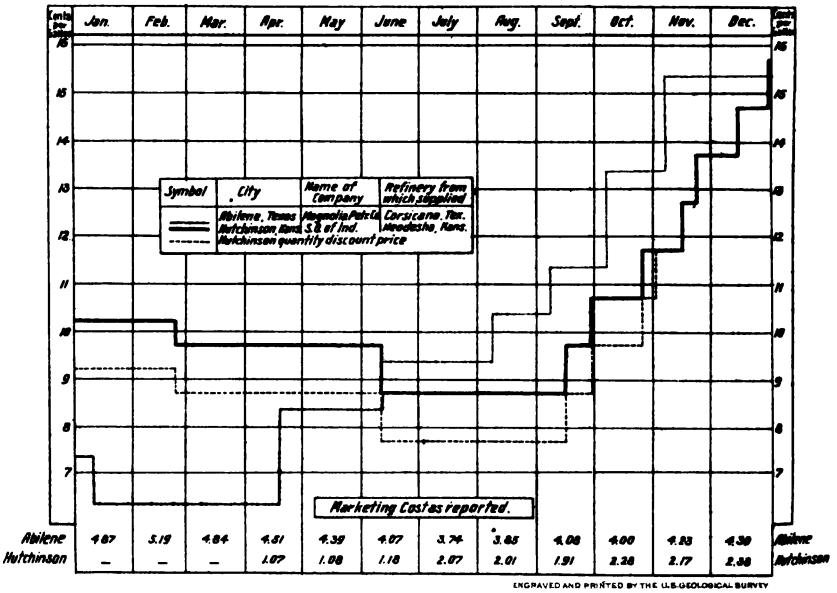
DIAGRAM 17. RELATIVE MOVEMENT OF TANK-WAGON PRICES, FREIGHT DEDUCTED, MADE BY SPECIFIED COMPANIES AT SPECIFIED POINTS, 1915.



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Final report of the Federal Trade Commission on the Price of Gasoline.

points lying in Louisiana and Indiana territories, respectively.[1] In July the Nashville price was 3 cents above the Waterloo price; and in September the inequality, allowing for freight, was actually as much as 5.5 cents. By December the rapid advance in Indiana territory reduced the difference to practically zero. During the months July to December, it should be observed that marketing costs at these points only differed by about three-fourths of a cent.

Attention is next invited to a comparison of gasoline prices in Indiana territory with those found in territories to the south and farther east, beyond Ohio. A ready comparison may be drawn from the following table, though, the prices being monthly averages, the extremes are not revealed:

TABLE 33.—MONTHLY AVERAGE TANK-WAGON PRICES OF GASOLINE IN SPECIFIED STATES REPRESENTING SPECIFIED STANDARD MARKETING TERRITORIES, FREIGHT DEDUCTED.

[All figures in cents per gallon.]

1915	Standard marketing territory and State.				
	Indiana (Illinois).	Kentucky (Kentucky).	New York (Massachusetts).	New Jersey (New Jersey).	Atlantic (Pennsylvania).
January	10.72	11.88	12.62	8.96	10.43
July	8.99	11.22	13.30	11.19	10.11
December	14.67	17.15	20.43	18.58	16.69

Across the Ohio River to the south and southeast of Indiana territory, lies the territory occupied by the Standard of Kentucky. As representing the two territories, two neighboring cities may be taken: New Albany, Ind., and Louisville, Ky. Diagram 16 shows that in the latter part of November and in December, 1915, the Kentucky price, allowing for freight, was 1.5 cents higher than in Indiana, though the reported marketing cost was actually lower. The chief source of supply for the State of Kentucky consisted in the shipments from the Standard of Indiana.

The diagram facing this page (Diagram 2) brings out with great force the inequalities between middle western and eastern gasoline prices. Allowing for freight, at the end of August, 1915, the price per gallon of gasoline was over 5 cents higher in Newark, N. J., than in New Albany, Ind. It was actually about 8 cents higher in Boston, Mass. Freight, it will be remembered, has been deducted; and the marketing cost as reported by the Standard companies concerned only varied by from 0.3 to 0.7 of a cent per gallon. Nearly the same difference existed during parts of December.

[1] The prices shown in the diagram for Nashville are those of the Indian Refining Co., but these were practically the same as those of the Standard of Louisiana. The average prices of the Louisiana company and competing "independents" are shown on p. 216.

This diagram serves to emphasize the inequality in rate of advance, also; for during January and the greater part of February the Newark price was lower than the New Albany price, and the Boston price was only 2.5 cents higher. This smaller difference in prices existed in spite of the fact that the marketing costs were much more divergent than in August.

The diagram also shows that the June cut in Indiana prices came at a time when prices in the East were high and advancing.

Another comparison of considerable interest as bearing upon the inequality in advance of gasoline prices may be made on the basis of Texas and Kansas points. Kansas is in Indiana territory; Texas is in Magnolia Petroleum Co. territory. Diagram 17 shows that in January, 1915, the quantity price in Hutchinson, Kans., allowing for freight, was 2.85 cents higher than in Abilene, Tex. In June when the Standard of Indiana reduced its prices and the Magnolia Co. raised its prices the price curves crossed and by August the price was 2.65 cents per gallon higher in Abilene, Tex., than in Hutchinson, Kans. In October the excess was increased to 3.65 cents. As the reported marketing costs for August, though probably too high for Abilene, Tex., differed by only 1.8 cents at the two points, it is apparent that this was an inequality that is difficult to explain by economic conditions. The diagram indicates the peculiarity of the June reduction and July–September low level in Indiana territory.

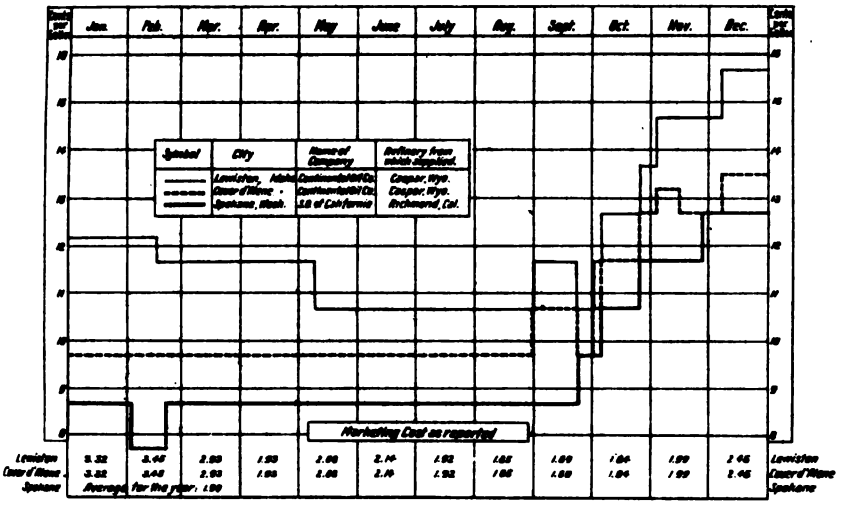
Attention is next directed to the Pacific Coast-Rocky Mountain section. The diagram facing this page (Diagram 18) presents a comparison between prices in specified towns in Continental Oil Co. territory and Standard of California territory, and shows that, allowing for freight and marketing costs, the prices in Continental points, Lewiston and Cœur d'Alene, Idaho, were higher than in a California company point, Spokane, Wash. The inequalities in decline and advance are again noticeable.

Section 2. Inequalities in the prices of other companies.

The foregoing comparisons have concerned the prices of various separate Standard companies. As these prices are substantially those of the other companies in their territories, however, they will be found to apply to all companies with substantial accuracy.

For example, take the comparison of The Texas Co. prices at various points specified in Diagram 3. At Austin, Tex., The Texas Co.'s price of gasoline was lower than at any of these points in January, 1915; but thereafter increased steadily until it was well toward the top in December. The wide divergence of the reported tank-wagon price at Denver, Colo., and the net price, allowing for quantity discounts (based on tank-wagon tickets), is noteworthy. Though several inequalities in advance are apparent, the general impression to be gained from the

DIAGRAM 18. RELATIVE MOVEMENT OF TANK-WAGON PRICES, FREIGHT DEDUCTED, MADE BY SPECIFIED COMPANIES AT SPECIFIED POINTS, 1915



Final report of the Federal Trade Commission on the Price of Gasoline.

DIAGRAM 19. RELATIVE MOVEMENT OF TANK-WAGON PRICES, FREIGHT DEDUCTED, MADE BY SPECIFIED COMPANY AT SPECIFIED POINTS, 1915.

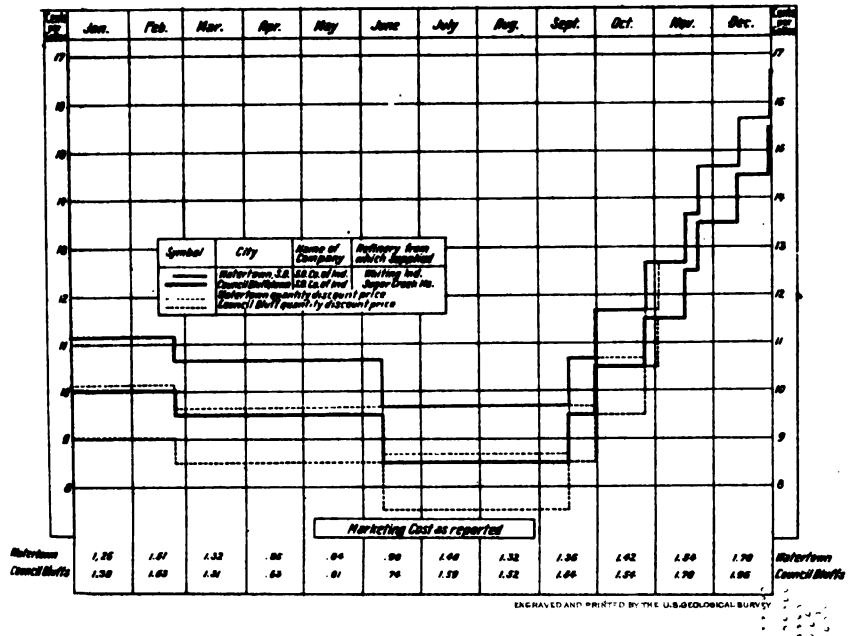


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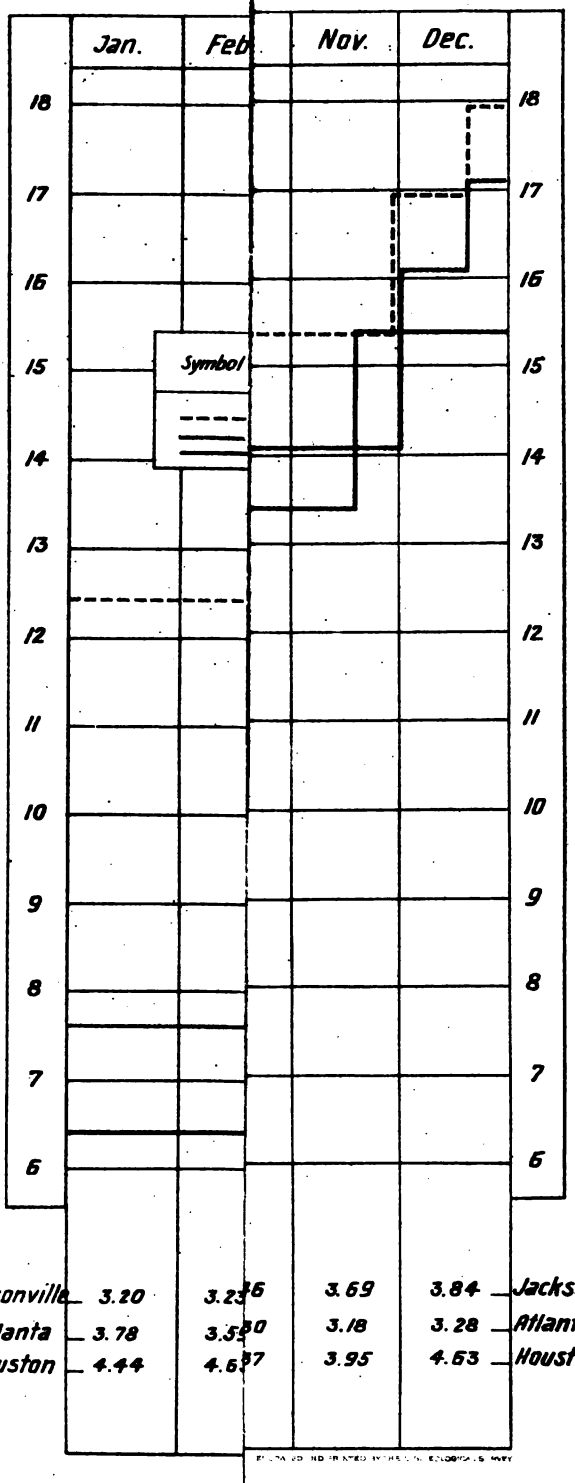
DIAGRAM 4. RELATIVE BY THE GULF REFINING CO.



ssion on the Price of Gasoline.

diagram is that the degree of divergence between the prices at the various points became less as the price advanced. This is noticeable in the case of the Norfolk and Albany prices. Aside from this tendency toward uniformity, the diagram indicates a general tendency for prices to vary at each point in the same direction and degree as the Standard company's price at that point.

A case in which the prices of a non-Standard company were notably out of line has been called to the attention of the Commission by investigations made in the South Atlantic States. Diagram 4 shows that there were serious inequalities in the prices made by the Gulf Refining Co. at the points specified. It will be observed that throughout most of the year marketing costs were similar, and that on the whole they were highest at the point where prices were lowest. Freight has been deducted. These allowances having been made, it still appears that up to November the price at Jacksonville was from 5 to 8 cents a gallon higher than at Atlanta. Similarly the net price at Atlanta during June, July, and August was considerably below the net price charged by the Gulf Co. at Houston, Tex. Indeed, the figures show that during this period gasoline was being sold by the Gulf Co. at Atlanta at a net price lower than the cost of production. If the reported marketing cost be deducted from the tank-wagon price minus freight, the balance is only a little over 4 cents per gallon, which is not enough to cover the cost of crude oil and refining properly chargeable to gasoline. That this condition was unsatisfactory to the company is indicated by the equalization of prices which took place toward the end of the year. The Savannah prices were similar to those at Atlanta and similar comparisons might be made as to them also.

Section 3. Quality of gasoline in different sections.

In considering the differences in price which have been found to exist among the various Standard territories, the question naturally arises, is the product sold as gasoline the same in quality in the several territories? And if not, is the difference sufficient to explain the difference in price? The Commission's agents collected samples of gasolines from different points; and the Bureau of Mines has both tested these samples and advised the Commission concerning the known differences between gasolines made from different crude oils. On this basis the following conclusions can be drawn:

Specific gravity—measured on the Baumé scale—is still the chief commercial test, and in case of a "straight-run" gasoline (one not "cracked" or blended) this test bears some relation to the volatility of the product. The Baumé test of a blended product, however, may be raised to any desired point—say, 64°—by mixing sufficient volatile material with a large proportion of heavy distillate—say, 54°

Baumé test. In this case gravity affords but a poor test of quality. The better test is the boiling point, both initial boiling point and end point being important, the former as indicating the most volatile element and the adaptability of the fluid for quick starting, the latter as indicating the ease with which the whole volume of liquid can be volatilized.

The Commission's samples show that on the whole the Baumé test of the gasolines commonly sold to motorists in the East are somewhat higher than those used in the West. In the territories of the New York, New Jersey, and Atlantic Refining companies, the Baumé test appears to have ranged around 60°–61° at the end of 1915, running from as low as 58° up to 65°. In Ohio, though the average was close to that in the territories just mentioned, the range was less, and on the whole the Baumé test appears to have been a little below, rather than above, 60°. (It will be observed that the Ohio company purchased a large part of its product from the Standard of Indiana, which company makes a motor fuel having a gravity of 58°–60° Baumé.) The Standard of Kentucky in Kentucky sells a gasoline which by actual test ranges around 58°–59°, and is also a large purchaser from the Standard of Indiana. In the Indiana company's territory, the Standard's gasoline mostly varies between 57° and 58°. Apparently, therefore, gravities in common use run all the way from 57° to 65°, but while in the Middle West the gravity was generally about 58°, in the East it was more commonly between 60° and 61°.

As the price of gasoline is supposed to increase from 0.25 to 0.5 cent for each degree of increase in Baumé test, it would seem, therefore, that on the basis of quality, prices in the East and Ohio should have been from 0.5 to 1.25 cents higher than in the Middle West. This conclusion, however, is modified by the fact that eastern gasolines were in large part, probably from 40 to 50 per cent, derived from Appalachian crude oils.

The nature of the crude from which the gasoline is manufactured affects the boiling point and distillation range, and consequently the volatility of gasoline. In a letter to the Commission, dated May 25, 1916, the Bureau of Mines, of the Department of the Interior, writes:

> Mid-Continent gasolines have slightly lower boiling points than Pennsylvania for a given Baumé gravity. Interchanging the relation, it may be said that for a given (boiling) point the Mid-Continent product would be from about 2.5° to 4° Baumé heavier (lower).

This is to say that a gasoline manufactured by an Oklahoma or Kansas refiner and having a Baumé test of 58°, as compared with 60° gasoline manufactured by a refiner of Pennsylvania crude, would have a slight advantage over the eastern product on the boiling-point basis. Gravity for gravity the gasoline from Kansas-Oklahoma crude is more valuable than gasoline from Pennsylvania crude. Of

course, large quantities of Kansas-Oklahoma crude oil are shipped to eastern refineries, to say nothing of the gasoline and naphtha which they purchase from western refiners; but, nevertheless, the fact that a relatively large quantity of gasoline made from Pennsylvania grade crude exists in the East is an important element in the comparison between East and West.

The marketers in Ohio and Kentucky, as already observed, purchase large quantities of gasoline from the Standard of Indiana, and the gravities prevailing in their territories do not differ much from those in the Indiana territory.

Section 4. Conclusion concerning general inequalities in price.

The conclusions to be drawn from the preceding facts are:

(1) Great differences existed in 1915 in the tank-wagon prices of gasoline in different sections of the United States, and also in retail prices.

(2) These differences corresponded very closely to the State lines which bound the various marketing territories of the several Standard companies.

(3) The differences were inequalities which generally did not correspond to differences in cost of production and marketing. Neither did they generally correspond to differences in demand and supply.

(4) These inequalities have a bearing on the advance in gasoline prices. The advance in 1915 was not a single uniform rise, as the public might suppose. What took place was really a series of unequal advances in different sections.

(5) Under free competition, the products of one section in which prices are low are attracted to areas where prices are high for a sufficient time, and there they increase the supply and reduce prices, thus tending to equalize the two markets. This has not been the case in the sale of gasoline. The conditions described in this chapter are consistent with the conclusion that as between the Standard marketers supplying the various Standard marketing territories effective competition did not exist. The boundaries of the Standard marketing territories appear to act as barriers behind which different prices exist.

(6) Those Standard companies which produced gasoline in low-price areas—notably the Indiana company—sold gasoline to Standard companies in neighboring territories without entering into competition with them, and without there being any considerable tendency to equalize prices.

The full significance of the foregoing inequalities can not be fully grasped until it is understood that the Standard of Indiana made large sales of gasoline to most of the neighboring Standard companies. (See p. 8.) The Kentucky, Nebraska, and even the Ohio companies bought a large part of the gasoline sold by them from the Standard

of Indiana, while the New York, New Jersey, and Atlantic companies made considerable purchases in certain months. The Continental Oil Co., too, secured its product largely from the Midwest Refining Co., which in turn drew upon the Casper (Wyoming) refinery of the Standard of Indiana (see pp. 8, 10, 144).

A condition as to which the Commission does not care to express any opinion, but merely to indicate as a fact, is the general practice of charging a uniform price in a State or marketing territory regardless of freight rates. This is done by various refining companies upon advice of counsel in order to simplify their accounts.

No adequate explanation of the differences in the price of motor gasoline among the different Standard territories is afforded by differences in the quality of gasoline sold therein.

THE STANDARD OF INDIANA AND THE "INDEPENDENT" JOBBERS.

One of the most persistent complaints which have reached the Commission has concerned the relatively low prices maintained in the marketing territory occupied by the Standard of Indiana. This territory embraces all of 10 North Central States, and a part of northern Oklahoma. It has been charged, especially by jobbers operating in Indiana territory, that the Indiana company reduced prices of gasoline in the Middle West, while, at the same time, another Standard company—the Prairie Oil & Gas Co., which is said to fix the price of Mid-Continent crude oil—put the price of crude up, and that the purpose was to catch the independent jobber between the upper and nether millstones and grind him out of business. In connection with this plan, it is alleged: (1) The Indiana company bought large quantities of crude; (2) it cut prices of gasoline, sometimes below the refinery cost to the jobber, and, when prices were forced up by advancing cost of crude oil, it followed somewhat behind the jobber; (3) it sold large quantities of its gasoline products to other Standard companies whose prices were maintained at higher levels.

While as already stated the Prairie Oil & Gas Co. apparently fixes the price of mid-Continent crude no evidence has been found showing the alleged purpose of that company to manipulate crude prices to the injury of independents. It is a fact that throughout the Indiana company's territory the Standard has met the fiercest competition. The independent jobbers, backed by independent refiners, engaged in strong competition for gallonage in this territory, and prior to 1915 and in the first four or five months of that year appear to have cut prices sharply. As already pointed out, there was a rush into both the refining and jobbing businesses during 1913, 1914, and early in 1915. The more substantial of the "independents" even

appear to have deplored the ensuing ill-considered competition, and regarded prices as too low in the first half of 1915. As a result the Indiana company had lost gallonage prior to 1915.

Section 5. Purchases of Oklahoma crude oil by Standard of Indiana.

It is a fact, furthermore, that the Indiana company bought large quantities of Oklahoma crude during 1915, so that its storage increased from 100,078 barrels on January 1, 1915, to 4,288,916 barrels on January 1, 1916. This increase, however, took place almost entirely after July 1, 1915, for on that date the company held only 156,530 barrels of crude in stock. The representatives of the company testified at the Commission's hearing that the chief purchases were made about the middle of September, which was the time the price of gasoline was advanced in their territory.

These purchases are mentioned, not because they involved a large quantity considered in relation to the Indiana company's consumption—for this was not the case—but because they had the effect of increasing the scarcity of Cushing crude, which threatened a large part of the small "independent" refineries.

Section 6. Prices made by the Standard of Indiana during 1915.

Again, it is a fact that the Indiana company reduced its price on gasoline on June 7. With relatively few exceptions it led the "independent" jobbers in this last cut, and they followed, though some independent refiners led in price reductions. The low level was maintained by the Indiana company till the middle of September, which, as will appear, is the most significant fact in the whole situation.

The Standard of Indiana made three reductions in the price of gasoline in 1915. The first cut of one-half cent per gallon on January 18 was effective principally in North Dakota and Illinois, and it served to bring prices in the latter State into line with the Indiana price. On February 22 another cut of 1 cent per gallon was made, which applied to the entire marketing territory. The third cut of 1 cent per gallon was made effective in most of the Indiana territory on June 7, and in the remaining sections on June 10, 1915.

That these reductions were justified by the decreased cost of crude is clear. In fact, refinery margins increased rather than decreased during the earlier months of 1915. That the reductions, however, were forced by loss of gallonage and cuts by competitors does not seem likely. The Standard of Indiana did not lose business to the jobbers in 1915, and the evidence submitted to show that cuts by jobbers compelled price reductions is not convincing.

It may be said that throughout the whole period in 1915 preceding the advance there were sporadic, scattering, small reductions made

by various concerns at numerous small towns. They existed both before the Standard's last reduction on June 7 and after the reduction. Ordinarily they could not determine the market price. Certainly the great bulk of the gasoline was sold at prices which followed "the Standard market." The tank-wagon market became 9.5 cents in Indiana territory only when the Standard of Indiana reduced its quotations to that figure; and it rose to 10.5 only when the same company decided to advance.

The low level of gasoline prices in Indiana territory was at most points about 9.5 cents per gallon, though at some Kansas and Missouri points the price was as low as 8.8 cents. From these prices there was a discount of 1 cent on purchases of 100 gallons or more. As a large part of the business was in such quantities, the price may be said to have been cut to 8.5 cents and at some points the price was as low as 7.8 cents. When freight is deducted there remained to the company on sales at many points but from 7 to 8 cents, and at some points less, out of which it had to pay marketing expenses and cost of production before any profit could be earned. Now 2 cents is said in the trade to be a fair average allowance for marketing expenses, and if this amount be allowed and be deducted from the tank-wagon price minus freight there remains but from 5 to 6 cents as a "net back"[1] to cover refining costs and profits. On sales at points where the quantity discount price was 7.8 cents the "net back" was less than 5 cents. This is pretty close to cost (see p. 91, Table 27), and certainly does not allow much margin of profit. Indeed, it is a little less than the price received f. o. b. the refinery, during June, July, and part of August, by the companies concerned, such prices being 5.99 cents to 6.34 cents for the Oklahoma-Kansas refineries and 6.33 to 6.46 cents for the Indiana company. It is shown on page 136 that the "net back" (wholesale price minus freight and marketing cost) to the Indiana company was less than its refinery price as reported in July, August, and September. Consequently there not only was no profit on marketing but a part of the usual refinery profits was lost.

Another fact is that the Standard of Indiana's Sugar Creek plant, which presumably supplied in part the low-price area near it in Missouri and Kansas, received lower f. o. b. refinery prices and made lower margins than the other Standard refiners which supplied their own territories with gasoline. At this plant the margin per gallon of gasoline produced (which does not include gasoline produced in earlier months) was −.43 cents in September (see Table 27, p. 91), and the margin between the cost of a gallon of crude oil plus the expense of refining the same and the price of the products secured therefrom in

[1] This is a trade term and is used here to mean what is left after deducting freight and marketing cost from tank-wagon price.

September was a loss of 0.12 cent (see p. 96). The books of the refinery did not show a loss for the reason that the sales in September included gasoline produced in other months, which amounts to raising the percentage of gasoline yielded by the crude run. The margin per gallon of crude oil is computed on the basis of the cost for the month of September and shows what would have been the result if the gasoline sold during the month had been produced during the month. That it shows a loss is conclusive evidence that the September price was too low to be maintained.

If, on the other hand, it be assumed that a price of 8.5 cents, or of 7.8 cents, was profitable in September, it becomes clear that an average tank-wagon price of 15.69 cents and an average f. o. b. refinery price of 11.56 cents in December, 1915, were much more than enough to cover expenses and yield a normal profit. This the Commission's investigation of costs makes clear (see Table 27), and attention is called to the increase in margins in December.

The Mid-Continent independent refiners, too, were at this time reduced to a very low profit or even to a loss in some cases. This is indicated by the margins shown in Table 29, page 97. Companies B, C, D, and E are such refiners.

Whether or not the Standard of Indiana reduced its price during July-September below a figure sufficient to cover all costs and yield a normal return on investment and a profit, it is apparent that the price was set so low that during a part of the time the "independent" jobber was not making such returns. On the basis of reports made by jobbers from approximately 100 towns having a population of 2,500 or over, scattered throughout Indiana territory, statistics have been compiled to show what the jobber's typical costs and prices were each month in 1915. Taking the most frequent figure as representative,[1] the following statement indicates that the typical jobber during the year paid prices ranging from 6 to 12 cents per gallon for gasoline f. o. b. the refinery:

Jobbers' typical f. o. b. refinery cost of gasoline (cents per gallon).

January	6.50	July	6.00
February	6.50	August	6.00
March	6.00	September	7.00
April	6.00	October	10.00
May	6.00	November	11.00
June	6.00	December	12.00

On the same basis, the jobbers' typical freight cost is indicated to have been 1.65 cents per gallon throughout the year.

Similarly, the jobbers' typical marketing cost as reported was 1.50 cents per gallon each month during 1915.

[1] It should be observed that the individual jobbers comprised in the groups whose prices and costs are taken as typical, are not identical.

The typical tank-wagon price received by the Indiana territory jobbers is shown in the following statement:

Jobbers' typical tank-wagon price (cents per gallon).

January	11.00	July	9.50
February	11.00	August	9.50
March	10.50	September	10.60
April	10.50	October	12.86
May	10.50	November	15.23
June	10.33	December	17.08

These prices are as reported by jobbers on sales in less than 100-gallon lots, and as the bulk of their business was in quantities over 100 gallons the quantity discount of 1 cent per gallon must be deducted to get the most significant figure.

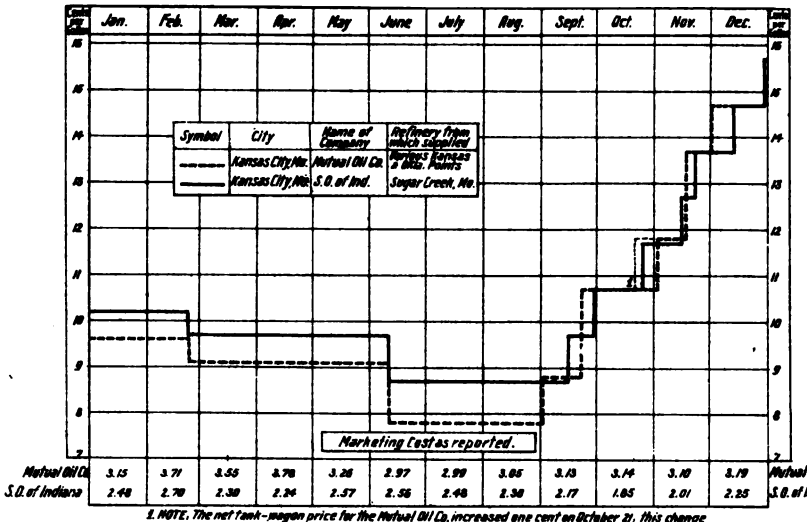
During the months from July to October the condition of the jobbers of gasoline in Indiana territory was precarious, and if it had not been for contracts with refiners which protected them by insuring cheap gasoline, the situation of a considerable part of the jobbers would have been impossible. It appears not only from the returns made by the jobbers but also from all the other evidence that in those months many of the jobbers were losing money on gasoline bought at current prices.

The Standard of Indiana has stated in explanation of the maintenance of its low price that it was giving the public the advantage of cheap crude oil. The facts concerning the continuance of the low price on the ground that cheap crude oil justified it are as follows:

In a brief submitted by the Standard of Indiana to the Commission it is stated that "It is true that we kept these low prices stationary from June 7 until September 15, even though the price of crude had in the meantime risen, not for the purpose of destroying our competitors, but because we were then supplying our trade with gasoline manufactured from low-priced crude, and we gave the public generally the benefit thereof." The force of this point, however, is weakened by the fact that the cost of crude advanced in August to this company as to most others, and in September was considerably higher than in July. (See pp. 91, 92.) Of course, its margins decreased, and the result was not that it gave the public the advantage of cheap crude, but that it gave them part of its usual profits. Moreover, the company advanced its prices so rapidly after September as to increase its margin and profits greatly, and the question arises, Why was it that it "gave the public" its profits in September, and not in November? It will be remembered in this connection that the stocks of crude purchased in September were held for speculative gain till some time in 1916, and not used to give the public cheap gasoline in October, November, and December, 1915.

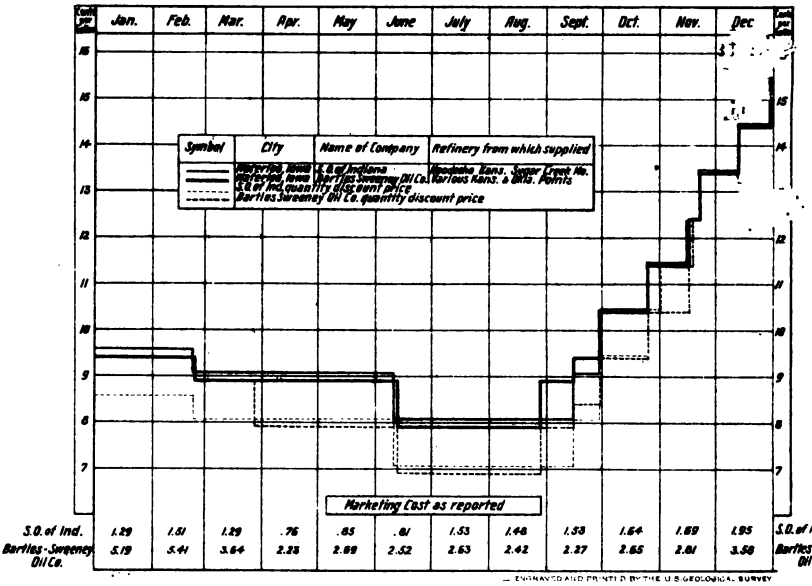
That the Indiana company pursued a different policy in dealing with parts of the public outside its territory is evidenced by the

DIAGRAM 22. RELATIVE MOVEMENT OF TANK-WAGON PRICES, FREIGHT DEDUCTED, OF THE STANDARD OF INDIANA AND AN INDEPENDENT JOBBER AT KANSAS CITY, MO., 1915.



1. NOTE. The net tank-wagon price for the Mutual Oil Co. increased one cent on October 21, this change is obscured by an unusual freight rate. The dotted line represents the price had the freight rate been normal.

DIAGRAM 23. RELATIVE MOVEMENT OF TANK-WAGON PRICES, FREIGHT DEDUCTED, OF THE STANDARD OF INDIANA AND AN INDEPENDENT JOBBER AT WATERLOO, IOWA, 1915.



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following excerpt from a letter dated July 28, 1916, addressed to the Commission by its vice president:

> The price which we had to pay for crude commenced to rise August 2, 1915, when an advance of 10 cents per barrel in the price of crude was charged. There were successive advances in the price of crude on August 4, 5 cents per barrel; on August 11, 5 cents per barrel, and on August 19, 5 cents per barrel. These advances were in straight-run crude, and did not represent the large premiums we had to pay for the fresh Cushing crude.

And the letter goes on to argue that the higher prices charged the Standard of New York and Standard of New Jersey in August and September were reasonable in view of these advances. Apparently, therefore, the company must have had some special reason for holding prices down in its own territory in August and September. Also, this letter casts doubt upon the assertion that its crude was cheap in August and September.

The facts concerning the advance in prices in the Indiana territory during the second half of the year are as follows: Kansas City may be taken as typical of the situation in the area of lowest prices in Kansas, Missouri, and Iowa, and there on September 1, 1915, the independent jobbers advanced prices 1 cent per gallon. This advance was not followed by the Indiana company till September 15. On September 22 the "independents" again advanced the tank-wagon price 1 cent, followed a week later by the Standard. This series of advances with the Standard concern lagging behind the "independents" characterizes the remainder of the year, until December 30, when both Standard and "independent" advanced their rates to 15.8 in Kansas City. The accompanying diagrams (Diagrams 22 and 23), showing the change[illegible]nk-wagon prices made by the Standard of Indiana and various "independent" jobbers, show the situation clearly. It is the general testimony of the "independent" jobbers in this territory that in order to remain in business they urgently needed to raise their prices during this period before the Indiana company advanced its marke[illegible]

Concerning the rise in September, the conclusion must be that, first, the "independents" felt themselves forced to advance prices; and, second, that the Indiana company did not desire to raise the prices at the time the "independents" did.

A further consideration in this connection is the fact that prices were advanced much earlier in other territories than that occupied by the Indiana company and its competitors. Thus, in New York State the advance began about June 7, with further advances in July, August, and early September—the very period in which the Indiana company was reducing to and maintaining its lowest price level. The Standard of Ohio raised prices at many points about August 23 and again on September 9, both advances antedating the advance in the

territory of the Standard of Indiana. In Kentucky the tank-wagon price was generally advanced between August 5 and August 27—instead of September 15, as in the Indiana territory—and several succeeding advances antedated the Indiana company's advances throughout the year. While these facts are especially significant, as Indiana gasoline was sold in large quantities in Kentucky and Ohio, it is further true that the Standard of New Jersey raised its prices on May 19, and the Standard of New York made an advance about June 7, with further increases in July, August, and early September. The gasoline prices of the Atlantic Refining Co. were raised on August 16, and again on September 1.

Section 7. Sales to other Standard companies, and prices in their territories.

It is a fact that the Standard of Indiana made large sales of gasoline to various refining and jobbing companies, in the territories of which prices were considerably higher than in its own. More than this, these sales were mostly made while prices were going down or were being maintained at low levels in the Indiana territory and were advancing elsewhere. During 1915 the Indiana company sold nearly 38,000,000 gallons of gasoline to the Standard of Ohio, of which amount 23,089,000 gallons were sold between June and September, inclusive. During nine days in June the Ohio price was 2.3 cents above the Indiana tank-wagon price for 100-gallon lots, and the same was true during considerable periods in September. In August there were differences of from 1.3 to 1.8 cents; and throughout July there was a difference of 1.3 cents.

In the Standard of Kentucky's territory, in the State of Kentucky, prices were raised before the advance in Indiana territory, and during September and October ranged 2 cents above Indiana prices. In these two months the Standard of Indiana sold the Standard of Kentucky 4,180,000 gallons of gasoline, the total sales for the year being over 12,540,000 gallons.

The Indiana company delivered to the Standard of New York 1,255,000 gallons of gasoline during August and September, 1915. During the greater part of this period, Indiana prices were at a minimum, while the New York company's prices were rising and ranged from 4 to 5.5 cents higher. To be specific, the diagrams show that the Indiana price in Detroit was 10 cents till September 15, with 1 cent off for purchases of 100 gallons, while the tank-wagon price in Buffalo was 14 cents in August and rose to 15 cents on September 6. This made the tank-wagon price actually 6 cents higher in Buffalo than in Detroit between September 6 and September 15. A glance at Diagram 2, page 117, will show that on September 7 the tank-wagon price in Fall River and Boston, Mass., was 17 cents,

while in New Albany, Ind., it was 9.5 cents, with 1 cent off on purchases of 100 gallons. Thus the price in Massachusetts was 8.5 cents higher than in Indiana.

Similarly, the tank-wagon price of gasoline in Newark and Elizabeth, N. J., on September 13 was 15 cents, while the New Albany, Ind., price was 8.5 cents per 100 gallons; and in September the Indiana company delivered 2,746,284 gallons of gasoline to the Standard of New Jersey.

It must not be supposed that the Standard of Indiana, as a corporation, received profits on these intercompany sales in proportion to the great margin between the tank-wagon prices prevailing in its territory and those of its neighbors—though, of course, the profit (due to the difference in prices) that it did not receive went to the stockholders of the other companies, among whom were the holders of a majority of the stock of the Indiana company. On the sales to the Ohio and Kentucky companies about 0.5 cent above the f. o. b. refinery price on sales in Indiana territory appears to have been charged. The representatives of the company stated to the Commission that these sales were made at 0.5 cent above the billing price to their own sales stations. But the sales to the New York and New Jersey companies were made at prices per gallon of 8 to 8.5 cents, respectively, which is over 1 cent higher than the company's average f. o. b. refinery price in August.[1] The difference may be due partly to the fact that the Kentucky and Ohio companies depend regularly and to a large extent upon supplies from the Indiana company, which is not the case with the New York and the New Jersey companies.

Section 8. Conclusion concerning conditions in Indiana territory.

To draw absolutely definite conclusions from the statement of facts is not easy. Taking up the points made in order, the purchase of crude oil by the Indiana company might be regarded as a natural and legitimate speculation on a rising market, and might be justified in part by the prospective needs of the company. In this particular case, however, the company made what were for it unusually large purchases of crude oil. The Indiana company's purchases were made about a month after prices of crude oil had begun to advance. They were made just at the close of an extraordinarily sustained period of unusually low gasoline prices, and just on the eve of a very rapid advance in such prices. The oil purchased was not used

[1] The details of these sales are as follows: On Aug. 17 a contract was made with the Standard of New York for 1,250,000 gallons at 8 cents f. o. b. Whiting, Ind., delivery to be made in 30 days. On Aug. 16, 2,500,000 gallons were contracted for by the Standard of New Jersey at 8 cents f. o. b. Whiting; and on Aug. 19 the same company contracted for 1,250,000 gallons at 8.5 cents f. o. b. Whiting, delivery to be made within 30 days. The average f. o. b. refinery price of gasoline at the Whiting works for the month of August was 6.89 cents per gallon, and the average for the company's three plants was 6.4 cents.

during 1915, but was held in storage. If, as is alleged by independent jobbers, these purchases were made with a view of increasing the scarcity of crude and consequently the cost of gasoline to the jobbers, they were well calculated to attain their end. Nevertheless, no positive conclusion with respect to this allegation can be made from the evidence.

As to price cutting, it is to be remembered that the independent jobbers had also engaged in this practice and prior to 1915 had made such low prices that their sales had gained largely on the Standard in Iowa, Kansas, and some other States. Also there was some price cutting by independents during the early part of 1915, partly, too, by means of special reductions to certain dealers. But the Standard of Indiana did not lose gallonage to the jobbers in 1915. Moreover, the establishment and maintenance by the Indiana company of an abnormally low price is not to be justified by reason of price cutting by its competitors on previous occasions. The facts have shown that it put in force the last cut in 1915 and that it kept its tank-wagon prices of gasoline down long after crude oil had risen in price and other companies had advanced gasoline prices. The tank-wagon price minus freight, moreover, was so low that it was under the sum of the Indiana company's refinery price plus a 2-cent margin for marketing. (See section 6, p. 124.)

As to sales to other companies, it might be supposed that these were made in the ordinary course of trade and represented a natural tendency to ship out of a low-price area into a high-priced one, a tendency which puts the supply where it is most needed. This supposition, however, can not be accepted without some analysis of the sales. Such analysis shows that these sales were in large part made throughout the year, both at times when the price in the area of destination was lower than in the Indiana territory and when it was higher. They were made chiefly, however, in August and September, and though the margin between Indiana and eastern prices became even greater in later months, the sales were discontinued. In time of stress from low prices in its own territory the stockholders common to the Standard of Indiana and other Standard companies found some relief in shipments to the eastern Standard companies, the relief coming partly through the higher prices received, but chiefly through the indirect channel of increased earnings by those companies the stocks of which were largely held by the stockholders of the Indiana company. (See p. 8.) Such shipments, it will be remembered, were not made in competition with the other Standard companies, but rather were consigned to those companies and delivered at various points in their territories for sale by them at their tank-wagon stations.

It should be added that *relatively* low prices might be expected in the territory occupied by the Standard of Indiana because of the competition of the large number of small refiners and jobbers in that territory supplied by the near-by Kansas-Oklahoma oil field. These jobbers, many of them, had contracts which guaranteed to them low refinery prices for 1915, sometimes specifying a margin of from 2 to 3 cents below any tank-wagon price made by the Standard. The "independent" refineries also went to considerable lengths in some instances to protect the independent jobbers by making low prices to them after crude began to rise. The competitive aspect of the case, however, is decidedly weakened in that the prices in the Indiana territory were evidently not made with any close regard for cost of production. Nor did the situation concerning stocks of gasoline and sales in August require low prices. They did not rise when the price of crude did, nor follow it closely. They were out of line with prices elsewhere.

Finally the very considerable advantages in producing gasoline which the Standard of Indiana enjoys over most "independent" companies should be noted; for those advantages mean low costs and might justify it in maintaining a low price. It was this company that introduced the Burton process of distilling petroleum, using a pressure still that produces a much larger yield of gasoline than ordinary methods. It has a very efficient system of filling stations in all large towns. During the latter part of 1915 it held abundant supplies of rich crude, secured at rather low prices. The Standard of Indiana, however, during 1915 did not make its prices with regard to its low cost of production, as is shown by its varying margin (see Table 27). Its low prices, moreover, were confined to an arbitrarily fixed territory. The company, like the other Standard companies, has confined its sales of gasoline on its own account to its own territory, while it has sold gasoline to other Standard companies which were maintaining relatively high prices just across State lines on all sides.

It is true that representatives of this company have argued that its production, actual or potential, was not adequate to enable it to extend its field of operation; but it should be noted that the Standard of Indiana could and did for several years supply many millions of gallons of gasoline to companies operating in other territories. In 1915 over 10 per cent of its total sales were made to the Standard of Ohio alone.

Section 9. Purchases of gasoline by Standard companies from Mid-Continent "independent" refiners.

It has been frequently alleged, chiefly by non-Standard jobbers, that during the second half of 1915 the various Standard companies

went into the Mid-Continent market for gasoline and bid up prices to the detriment of "independent jobbers." The several Standard companies concerned state that they did make considerable purchases late in 1915, but that this was done in the ordinary course of trade and to insure supplies of gasoline to their customers.

In order to ascertain the facts, the Commission addressed a letter of inquiry to 24 Mid-Continent non-Standard refiners, all but eleven of whom stated that they had made no sales to any Standard concern. The facts as reported by the eleven are shown in the next table.

The figures shown have been compared with the purchases made by the Standard companies of Kentucky, Ohio, and Indiana, and agree approximately. They are probably not complete, however, for the reason that some relatively unimportant refineries were not included in the inquiry; and doubtless some sales made to jobbing concerns were transferred to Standard companies.

TABLE 34.—SALES OF GASOLINE AND NAPHTHA TO STANDARD COMPANIES BY MID-CONTINENT INDEPENDENT REFINERS WHO REPORTED SALES TO STANDARD COMPANIES IN 1915.

Sales by—	Purchaser.	Date.	Gallons.	Average price per gallon.
				Cents.
Chanute Refining Co., Chanute, Kans.	Magnolia Petroleum Co.	June 3	[1] 160,000	6.25
Do	do	June 11	[1] 880,000	6.25
Do	do	Sept. 15	[1] 1,000,000	[2] 8.75
Constantin Refining Co., Tulsa, Okla.	Oil Marketing Co.,[3] Chicago, Ill.	Dec. 7-20	255,811	.....
Cosden & Co., Tulsa, Okla	Standard of Ohio	Dec. 6-31	696,557	12.99
Do	Standard of Kentucky.	Dec. 29	13,011	
Do	Magnolia Petroleum Co.	Oct. 27	165,481	11.00
Consumers Refining Co	Standard of Kentucky.		100,350	.....
Do	Standard of Indiana		280,216	.....
Do	Magnolia Petroleum Co.		525,660	.....
Cudahy Refining Co., Chicago, Ill	Standard of Kentucky.	December	37,988	12.50
Ponca Refining Co., Oklahoma City	Standard of Nebraska.	Dec. 12	80,432	11.50
Central Refining Co., Lawrenceville, Ill.	Imperial Oil Co., Canada.	October and November.	40,229	13.00
Indiahoma Refining Co., St. Louis, Mo.	Standard of Kentucky.	Dec. 17-28	238,820	.....
Do	Magnolia Petroleum Co.	Aug. 12	8,000	6.50
Do	do	Oct. 22	136,000	11.50
Do	do	Oct. 27	248,490	11.63
Ardmore Refining Co., Tulsa, Okla	Standard of Ohio	Dec. 20, 1915, to Feb. 9, 1916.	102,393	12.95

[1] Number of tank cars only reported. Estimated by the Commission at 8,000 gallons per tank car.

[2] Based on 80 cent crude oil, to fluctuate one-quarter cent per gallon for each 5 cents per barrel advance or decline in crude.

[3] The Oil Marketing Co. classed at another point in this report as an independent concern sold 491,444 gallons to the Standard of Ohio in December at an average price of 12.75 cents.

TABLE 34.—SALES OF GASOLINE AND NAPHTHA TO STANDARD COMPANIES BY MID-CONTINENT INDEPENDENT REFINERS WHO REPORTED SALES TO STANDARD COMPANIES IN 1915—Continued.

Sales by—	Purchaser.	Date.	Gallons.	Average price per gallon.
				Cents.
International Refining Co., Tulsa, Okla.	Standard of Ohio	Dec. 5-29	541,027	13.01
Do	Standard of Kentucky.	Dec. 20-22	35,337	13.37
Do	Standard of Nebraska.	Dec. 29-30	33,180	12.58
Do	Atlantic Refining Co.	Nov. 6-11	42,999	10.89
New State Refining Co	Magnolia Petroleum Co.	June 16	209,177	6.25
Total			5,831,208	
Summary of purchases.				
Magnolia Petroleum Co			3,332,808	
Standard of Ohio			1,339,977	
Standard of Kentucky			425,506	
Standard of Indiana			280,216	
Standard of Nebraska			113,662	
Imperial Oil Co			40,229	
Atlantic Refining Co			42,999	
Oil Marketing Co.[1]			255,811	

[1] The Oil Marketing Co. classed at another point in this report as an independent concern sold 491,444 gallons to the Standard of Ohio in December at an average price of 12.75 cents.

The table shows that the largest sales were made to the Magnolia Petroleum Co., the quantity being over 3,300,000 gallons. As this company sold some 14,000,000 gallons during 1915 to the Standard of New Jersey, Standard of Kentucky and Standard of New York, there was a virtual transfer of Mid-Continent independent gasoline to eastern Standard companies. The next most notable point revealed by the table is the relatively large quantity of "independent" gasoline—over 1,300,000 gallons not including purchases from the Oil Marketing Co.—purchased by the Standard of Ohio, all in the month of December. This was due in part to the fact that they were unable to make as large purchases as usual from the Standard of Indiana. Also the Standard of Kentucky bought over 400,000 gallons, apparently all in December. The former company, though operating a refinery, is unable to supply its territory, and in 1915 depended chiefly upon the Standard of Indiana. The Standard of Kentucky was a pure marketing concern, also largely dependent upon the Indiana company.

The price reported as received at the refinery is not far from the average f. o. b. refinery price in December for Kansas-Oklahoma refineries (Statistical Exhibits, Table 33, p. 196), which was 12.17 cents; but in most cases the average on these sales by independents to Standard companies was slightly over this figure.

The effect of these sales was to raise the refinery price of gasoline at the Mid-Continent refineries, and they resulted in increasing the difficulties of the western jobber. Although the Ohio company was somewhat exceptional in that it increased its stocks of gasoline toward the end of 1915, there is no direct evidence to show that this result was in pursuance of any plan, or that there was any purpose in the minds of the officers of the Standard of Ohio other than to benefit their own company by increasing its stocks of gasoline on a rising market.

Section 10. Inequality of prices between Ohio and Indiana territories.

Two questions frequently raised are, Why were prices so different in Ohio and Indiana territories, and were they not either too low in Indiana or too high in Ohio? As the Ohio Standard company purchases its gasoline largely from the Indiana company, differences in quality and refinery cost are nearly eliminated and an especially close comparison is afforded. The representatives of the two Standard companies involved stated that they were able to give no explanation of the situation.

THE DIFFERENCE NOT BASED ON COST.—From January to August tank-wagon prices of gasoline, without quantity discount, were similar in the two territories, being only from 0.6 to 0.8 cent lower in Indiana. Most of the Indiana company's sales, however, were at a discount of 1 cent per gallon, which discount was not in effect in Ohio, and consequently the Ohio price was really over 1.5 cents above the Indiana price. Some time after November 1,[1] the discount was withdrawn, and in December the difference in average prices in the two territories was 1.44 cents. As already pointed out, the facts are that in Ohio the price was raised earlier than in Indiana territory, the advance in the latter not coming generally until the middle of September. Taking September, then, as the turning point, the average tank-wagon price in Ohio was 11.44 cents, or 0.83 cent per gallon higher than in Indiana territory; and allowing for the 1-cent discount, the real difference was 1.83 cents. Of course, differences in freight and marketing costs must be allowed for, but when these items are deducted from the net tank-wagon prices there was a "net back" to the refineries of the two companies of 9.02 cents in Ohio and 6.78 cents in Indiana, making an increase in the excess in Ohio, the difference in "net back" being 2.24 cents.

Difference in the costs of refining of the Indiana and Ohio companies has little significance in a consideration of the difference in their prices, for the reason that Ohio prices were based on the cost of gasoline purchased from the Indiana company (see p. 135). Such purchases made the bulk of the Ohio company's sales.

[1] The company reports that it was withdrawn on Nov. 1, but the Commission's agents find that at various points garages received the discount for some time later.

The reduction in price in the early part of 1915 was not such in the Indiana territory that the relative rises which took place later were merely calculated to equalize conditions. In the first place, the Indiana price, though lower than the Ohio price, remained in practically the same relation to the latter throughout the first seven months of the year.

In the second place, a comparison of the monthly average "net backs" on Standard of Indiana gasoline as sold in Indiana territory and in Ohio territory (see Statistical Exhibits, Table 35, pp. 202–203), where it was the most important source of supply, indicates that the "net back" from Ohio territory prices increased relatively to that from Indiana prices from February through September. It remained relatively high in October, November, and December, the excess over the Indiana territory "net back" being 1.20 cents in December.

STANDARD OF INDIANA PRICES IN SEPTEMBER, 1915, TOO LOW.—As bearing on the question, whether the price of gasoline was either too low in Indiana or too high in Ohio, especially in the third quarter of 1915, the fact that the Indiana company made large sales to the Ohio company should be noted. Such sales amounted to nearly 38,000,000 gallons in 1915; and they not only constituted an appreciable element in the Indiana company's business (15 per cent of its production and 10 per cent of its sales), but a dominant element in the Ohio company's sales. This appears from the fact that the purchases from the Standard of Indiana were nearly three times the production at the Ohio company's Cleveland plant, and the officers of the Ohio company stated to the Commission that the price of gasoline in Ohio was largely determined by the price paid on outside purchases. It is a fact that these sales were made at a price f. o. b. the Woodriver refinery of the Standard of Indiana, which was .5 cent above that received on sales in Indiana territory, and included a profit to the Indiana refinery. It is also a fact that the gasoline thus sold was resold in Ohio at a tank-wagon price which was in advance of the Indiana tank-wagon price by from 1.5 cents to 2.5 cents. The result was, of course, that the Ohio company also made a profit on the resale of Indiana gasoline. In September, the average f. o. b. refinery price of the Standard of Indiana was 7.03 cents per gallon; the freight rate from Woodriver, Ill., to Columbus, Ohio, was 1.12 cents, the marketing cost of the Ohio company was 1.79 cents, making a total cost of 9.94 cents per gallon. At Columbus, the average tank-wagon price was 11.42 cents per gallon, making an average gain in September on the Indiana gasoline of 1.48 cents, practically 1½ cents per gallon. It is to be remembered that the price paid the Indiana company covered any profit on the refinery operations of that company. At Dayton, Ohio, the average gain, figured on the same basis as the Columbus gain, was 1.66 cents. If

the gain be put at 1.5 cents, the total profit on the 5,831,711 gallons purchased from the Standard of Indiana in September was over $87,000. Through the year nearly 38,000,000 gallons of the Indiana company's gasoline were sold at various margins.

To put the matter in another light, the average net back on the Standard of Indiana's business in its own territory was, in September, 6.78 cents,[1] while the net back on the sales of the same company to the Standard of Ohio was 8.49 cents, an excess of 1.71 cents per gallon. The majority of the stock of the Indiana and Ohio companies was held by a common group of stockholders (see p. 145), and the differential in Ohio operated toward maintaining the profits received by a majority of the Indiana company's stockholders at a level with the Ohio profits in spite of the lower prices in Indiana territory.

Further light is thrown upon this question by comparing the "net back" from tank-wagon sales with the f. o. b. refinery price. In the case of the Indiana company this comparison shows a failure of such "net back" to cover the refinery price in several months, as shown in the following table:

TABLE 35.—STANDARD OF INDIANA'S AVERAGE REFINERY PRICE AND AVERAGE "NET BACK" ON SALES IN INDIANA, OHIO, AND KENTUCKY TERRITORIES, 1915.

[All figures in cents per gallon.]

Month.	F. o. b. refinery price.	"Net back" in Indiana (100-gallon lots).	"Net back" in Ohio.	"Net back" in Kentucky.
January	7.50	7.65	7.74	9.05
February	7.38	7.30	7.13	9.03
March	7.23	7.25	7.45	8.98
April	6.91	7.58	7.75	8.94
May	6.71	7.82	7.80	8.82
June	6.46	6.83	7.42	8.71
July	6.33	6.09	7.55	8.83
August	6.44	6.17	7.28	9.08
September	7.03	6.78	8.49	9.80
October	8.05	8.41	9.85	10.94
November	9.74	10.85	11.68	12.13
December	11.56	12.33	13.53	14.35

It will be observed that the "net back" to the Standard of Indiana, after deducting freight and marketing cost from the tank-wagon price, was less than the f. o. b. refinery price in the three months July, August, and September. These are months in which the Standard of Indiana was maintaining its minimum price, while the Ohio company advanced its price in August. It is also noteworthy that the "net back" on the gasoline sold by the Indiana company

[1] Allowing 1 cent discount.

for resale in Ohio and Kentucky was considerably greater than in its own territory.

Table 28, page 96, shows that, on the basis of crude consumed, and considering the operations of each month as though the products of that month were sold at the current prices, there was a loss made at the Sugar Creek refinery and a very low margin at Whiting. Also, on the basis of by-product costs and margins, computed so as not to include sales of the stocks of products carried over from previous months, the margins of September were notably lower than those of other months. (See Table 27, pp. 91, 92.)

Further evidence that the price of gasoline was for a time very low in Indiana territory may be seen in the fact that September was the only month in which the value of the gasoline fraction obtained by the Standard of Indiana failed to cover the cost of the crude used.

Again the sharpness of the advance in Indiana territory, when once begun, is notable. This was due chiefly to the removal of the discount of 1 cent per gallon on 100-gallon lots in November. The net rise in average tank-wagon price in Indiana territory between September and December was about 6.08 cents as compared with 5.69 cents in Ohio, while the rise at representative points between September 1 and December 31, 1915, was 7 cents in Ohio and 8 cents in Indiana.

These facts lead to the conclusion that the Indiana price was too low in September.

CHAPTER VI.

RETAIL PRICES AND MARGINS.

It has been alleged by some that the retailer is responsible, in part, at least, for the high price of gasoline in the latter part of 1915. In order to get the facts concerning this matter, both tank-wagon and retail prices were secured by the Commission's agents from garages and filling stations in representative localities in all parts of the country. The result of this investigation shows that the retailers generally were not responsible for, and on the whole did not profit by, the increase in prices. While in some instances their margins increased, in many instances they were seriously diminished, and taking the retailers as a whole, their margin of profit did not increase.

In the Statistical Exhibits attached to this report will be found Table 36, showing retail prices of gasoline and the margins made by retailers in the various Standard marketing territories and in representative States therein. The figures for Standard and other companies are strictly comparable, as each is made up on the basis of the same towns and is secured from groups of retailers purchasing from Standard or other marketing companies.

There follows a condensed table, showing for retailers supplied by Standard and other companies in the months of January, July, and December, 1915, the average tank-wagon and retail prices and the margin between them:

TABLE 36.—AVERAGE MONTHLY TANK-WAGON PRICE, RETAIL PRICE, AND MARGIN ON GASOLINE IN STANDARD MARKETING TERRITORIES, BY SPECIFIED MONTHS, 1915.

[Cents per gallon.]

Standard marketing territory.	Company group.	Tank-wagon price.[1]			Retail price.			Margin.[1]		
		January.	July.	December.	January.	July.	December.	January.	July.	December.
New York.....	Standard..	12.48	13.18	20.63	15.04	15.25	21.63	2.56	2.07	1.00
	Other.....	12.51	13.11	20.50	14.97	15.18	20.90	2.46	2.07	.40
Atlantic.....	Standard..	11.00	11.00	17.42	14.39	13.39	19.14	3.39	2.39	1.72
	Other.....	11.19	10.88	17.62	14.21	13.16	19.09	3.02	2.28	1.47
New Jersey.....	Standard..	12.16	12.16	19.39	14.73	14.93	20.86	2.57	2.77	1.47
	Other.....	12.90	12.71	19.85	14.61	14.57	20.45	1.71	1.86	.60

TABLE 36.—AVERAGE MONTHLY TANK-WAGON PRICE, RETAIL PRICE, AND MARGIN ON GASOLINE IN STANDARD MARKETING TERRITORIES, BY SPECIFIED MONTHS, 1915—Continued.

[Cents per gallon.]

Standard marketing territory.	Company group.	Tank-wagon price.			Retail price.			Margin.		
		January.	July.	December.	January.	July.	December.	January.	July.	December.
Ohio	Standard	11.61	10.80	17.13	13.91	11.85	18.61	2.30	1.35	1.48
	Other	11.35	10.30	17.29	12.81	12.02	18.74	1.46	1.72	1.45
Kentucky [1]	Standard	14.23	13.83	19.77	14.47	14.21	19.87	.24	.38	.10
	Other	13.23	13.10	19.29	14.61	14.10	19.43	1.38	1.00	.14
Indiana [1]	Standard	11.06	9.53	15.21	12.48	10.76	16.30	1.42	1.23	1.09
	Other	11.86	9.99	16.27	12.67	11.17	17.02	.81	1.18	.75
Nebraska	Standard	11.50	10.00	15.90	.....	10.00	16.97	.....	.00	1.07
	Other	11.50	10.00	16.61	15.00	10.00	.....	3.50	.00	.....
Louisiana [1]	Standard	12.18	12.13	18.12	11.82	12.13	18.25	[2].36	.00	.13
	Other	13.08	12.38	17.95	14.03	13.46	18.96	.95	1.08	1.01
Magnolia	Standard	9.83	10.50	17.31	12.00	12.48	20.30	2.17	1.98	2.99
	Other	11.52	11.44	18.30	11.95	11.42	19.31	.43	[2].02	1.01
Continental	Standard	15.71	13.43	20.78	18.70	17.01	24.05	2.99	3.58	3.27
	Other	15.94	15.19	20.95	19.30	18.07	23.28	3.36	2.88	2.33
California	Standard	12.27	11.02	14.88	14.82	13.32	16.93	2.55	2.30	2.05
	Other	12.91	11.48	15.73	15.04	13.61	16.58	2.13	2.13	.85

[1] Tank-wagon prices and margins are based on reported prices for minimum quantities. As in some territories much gasoline was sold during 1915 at reduced prices, the actual average tank-wagon prices received was less and the margin more than the figures shown in the table.

[2] Loss.

In a general way it may be said that the ordinary retailer's margin is from 2 to 3 cents in the East, about 1.5 cents in the South and in the Middle West, and around 3 cents in the Mountain States. The lowness of the retailer's margin in the Southwest is noticeable. Some garages and filling stations were content to sell gasoline at cost, this course being resorted to as a means of drawing trade on sundries and other supplies upon which a substantial profit might be realized. Other concerns in the same town demanded a margin at least sufficient to pay for the expense of handling the gasoline, while others required a margin that would give a slight profit.

In a majority of cases the territories having high tank-wagon prices also show relatively large margins.

There were exceptions, however, to this parallelism. In the territories of the Continental and Magnolia companies, the December retail prices in representative towns were, relatively to prices in other territories, considerably higher than were the tank-wagon prices, for in these two territories the margins for garages selling Standard gasoline were 3.27 cents and 2.99 cents, respectively. More than

this, in California territory, where the tank-wagon price was relatively low, the retail margin appears to have been high enough to bring the retail price up to the Indiana prices in December. On the other hand, in Louisiana and Kentucky territories, the retailer's margin was so low that in spite of high tank-wagon prices, the retail price was not relatively high.[1] (In these two territories the garages supplied by Standard refiners showed a lower margin than the "independents.")

On the whole, moreover, in the East and on the Pacific coast the margins made by retailers, though high, indicate a downward tendency as prices rose toward the end of the year.

As to any difference between Standard and other retailers, it is at once apparent that the average monthly tank-wagon (wholesale) prices of gasoline, while differing widely in different territories, were quite similar for Standard and other companies within the same territory; while not identical, the differences were not great, and the excesses of one over the other were pretty evenly divided between the two groups.

On the other hand, the differences between the retail prices of garages and filling stations supplied by Standard and other companies are more marked. The prices of those retail distributors which were supplied by the Standard appear to have been in excess of the others in the following territories: New York, New Jersey, Atlantic, Magnolia, and, to some extent, Indiana and Kentucky.

It follows that the margins received by retail dealers which were supplied by these various Standard refiners operating in these territories, were in excess of those received by other retailers. But more than this, the margins of those distributors which were supplied by the Standard companies appear to have been greater in some of the other territories; so that the only marketing territories in which the Commission's statistics indicate margins that were lower for Standard garages than others, were the Kentucky, Louisiana, and possibly the Nebraska territories.[2]

These facts and analyses are presented as being of interest to the consumer; but they do not seem to point to any clear conclusion of a positive nature. The Commission has evidence indicating that in some towns retailers have organized to maintain margins, and isolated cases of unreasonably high prices demanded by individual dealers have come to its attention. There is no evidence, however, that this was a cause of the general advance in prices to consumers.

[1] The margins in these territories, however, would be larger if allowance could be made for discounts made in purchases of large quantities.

[2] Even in these territories, the facts are not clear as it has not been practicable to allow for quantity discounts made to garages on large purchases.

CHAPTER VII.

POSITION OF THE STANDARD COMPANIES IN THE INDUSTRY.

In the preceding chapters it has been shown that the advance in gasoline prices during 1915 exceeded the increase in the cost of production and can not be entirely explained by increased cost or by the condition of supply and demand. It was in part the result of excited market conditions which affected prices of both crude oil and refined products. The existence of inequalities in the advances in prices in the various Standard marketing territories has been shown, and in the present chapter the position of the several Standard companies in the industry will be stated for the purpose of showing the relation of the absence of competition among these companies to the price situation.

Section 1.—Dominant position of the Standard companies in their several marketing territories.

The fundamental condition which militates against the effective working of competition in the petroleum industry is the fact that the country is arbitrarily divided into 11 separate gasoline markets (see p. 22), corresponding to the 11 marketing territories of the several Standard companies, in at least 9 of which the particular Standard company concerned is the dominant factor. On the basis of tank-wagon sales in towns having a population of 2,500 or over, estimates have been made of the relative volume of the sales of gasoline by the several Standard companies in their respective territories. As these estimates are based upon only a part of the total business, and as the Commission is not in possession of complete statistics of the so-called independents, the estimates must be taken with allowance for a small margin of error. The figures, however, are believed to be approximately the correct percentages, and indicate fairly accurately the comparative position of the several Standard companies in their respective territories. They show that the Standard companies control approximately 65 per cent of the gasoline business throughout the United States. Although their percentage of control has declined since 1906, when testimony taken in the Standard Oil case showed them to possess approximately 85 per cent of the business, nevertheless they still occupy a dominant position in the trade, and the aggregate volume of their business has increased. Moreover, a material part of the apparent decline in percentage of control by Standard companies is due to the fact that certain large companies, in which various Standard stockholders have considerable interests, are classed as

"independents" in this report. Standard stockholders owned about 30 per cent of the stock of the Tidewater Oil Co. and about 25 per cent of the stock of the Texas Co., which are here classed as "independent." Another company included among the "independents" in 1915 is the Midwest Refining Co., though it is known to have operated in such a way as to have made it an ally rather than a competitor (see pp. 8, 10), and is now reported[1] to have come under the direct control of the Imperial Oil Co. (Ltd.), of Canada, which is a Standard concern. These facts indicate that the statement that Standard companies controlled approximately 65 per cent of the gasoline business of the United States is conservative. It does not mean that all the remaining 35 per cent of the business was strictly competitive.

TABLE 37.—ESTIMATED PERCENTAGES OF THE TOTAL QUANTITY OF GASOLINE SOLD IN THE SEVERAL STANDARD MARKETING TERRITORIES BY THE SEVERAL STANDARD COMPANIES OPERATING THEREIN DURING 1915.

Territory[1] of—	Per cent of total sales of gasoline.	Territory[1] of—	Per cent of total sales of gasoline.
Standard of New York	70	Standard of Indiana	60
Atlantic Refining Co	70	Standard of Kentucky	50
Standard of Ohio	70	Standard of California	48
Continental Oil Co	63	Standard of Louisiana	33
Standard of New Jersey	60	Magnolia Petroleum Co	27
Standard of Nebraska	60		

[1] See p. 22f.

At a hearing held by the Commission on June 12 and 13, 1915, representatives of the Standard Oil Co. of New York stated that 70 per cent was approximately correct for their territory to the best of their knowledge. Representatives of the Standard of Ohio also stated that, according to oil-inspection records in Ohio, their company sold about 65 per cent of the gasoline in that State, which figure is only a little less than the Commission's estimate. The Indiana percentage, it should be observed, applies to the whole territory, but in some States—as in Kansas and Iowa—the percentage was somewhat lower. Indeed, the Indiana company's volume of sales for Kansas, computed on the basis of tank-wagon sales at towns of 2,500 or over, was only 46 per cent in 1915.

Section 2.—Community of interest through common-stock ownership.

Moreover, the stockholders of all of these companies are to a large extent the same individuals or interests. This community of interest includes the marketing, refining, oil-producing, and pipe-line properties. The Commission, in the course of its general investigation of the oil industry, has secured from the several Standard

[1] See Oil Trade Jr., Feb., 1917, p. 79, and Oil, Paint, and Drug Reporter, Jan. 29, 1917, p. 60.

companies lists of their stockholders as of January, 1915. A study of these lists shows that, although some changes have taken place in the ownership of these companies since the dissolution, a majority of the stock of each is held by a small group composed of the same individuals, trustees, or corporations. For example, when those who held 300 shares or over in the Atlantic Refining Co.[1] are taken as a basis, it is found that they held 55 per cent of this company's stock, 55 per cent of the stock of the Standard of Indiana, 53 per cent of the stock of the Standard of Ohio, 53 per cent of the Standard of Kentucky, 53 per cent of the Standard of Nebraska, 54 per cent of the Standard of New Jersey, 53 per cent of the Standard of New York, 52 per cent of the Continental Oil Co., 55 per cent of the Prairie Oil & Gas Co., and 55 per cent of the Prairie Pipe Line Co. If the holdings under 300 shares were considered, the percentage of common holding would run to approximately 70 per cent. It is known that Messrs. Archbold and Folger own approximately 70 per cent of the stock of the Magnolia Petroleum Co.[2] The Standard of New Jersey owns practically all of the stock of the Standard of Louisiana and of the Carter Oil Co. That there is a community of interest with large oil-producing properties is clear.

Moreover, it is to be pointed out that the leading officers and directors of the several Standard companies often hold stock in two or more of these companies. The market value of these holdings at the end of 1915 are shown in each case in parenthesis. Thus, the president of the Standard of New Jersey, who in 1915 held 6,000 shares ($3,258,000) in his own company, also owned 4,575 shares ($1,029,375) in the Standard of New York, 300 shares ($207,000) in the Atlantic Refining Co., and 1,858 shares ($1,012,610) in the Standard of Indiana, and 1,100 shares ($480,150) in the Prairie Oil & Gas Co. Similarly, the presidents and some of the directors of the New York and of the Atlantic Refining companies own considerable stock in the other companies mentioned.

The president of the Standard of Indiana, who is also a director owned 303 shares ($165,135) in his own company, 420 shares ($228,060) in the Standard of New Jersey, 320 ($72,000) in the Standard of New York, 256 ($47,872) in the Ohio Oil Co., 217 ($6,944) in the National Transit Co. (a pipe line), 115 ($26,795) in the Prairie Pipe Line, 100 ($11,350) in the Indiana Pipe Line, 76 ($33,174) in the Prairie Oil & Gas Co., 64 ($15,040) in the Vacuum Oil Co., 14

[1] The different family or institution names included in this list follows: Rockefeller, Harkness, Pratt, Northern Finance Corporation, Flagler, General Education Board, Bostwick, Houston (trustees), Ledyard and Whitney, Rogers, Babbott (trustees), Huntington (trustees), Goelet, Macy, Mason, Archbold. In all, there appear to be 29 different individuals embraced in this list of 16 names. The Northern Finance Corporation is a company for investment and dealing in securities whose officers, directors, and stockholders are stockholders in one or another of the Standard companies. The directors are Lewis Cass Ledyard, Payne Whitney, Lewis Cass Ledyard, jr., and Harry Payne Bingham.

[2] Held in trust for them by Judge F. A. Williams, of Galveston, Tex. See p. 23.

($7,560) in the Standard of Ohio, 12 ($3,300) in the Continental Oil Co., and holdings in several other companies, chiefly pipe lines and producers.

Numerous examples of a similar nature might be given.

Moreover, there are the cases of officers and directors who hold stock in several companies. These cases do not show that the officers and directors of one company hold sufficient stock in other companies to exert a controlling influence by their votes upon the policies of the other companies; but they do show the possession of a sufficient financial interest in the other companies to lead to the conclusion that their attitude toward competition with the other Standard companies would be directly influenced.

Some of the features and consequences of this community of interest described above are discussed in the sections which follow.

Section 3. Effect of community of interest on competition.

The community of interest described in the preceding section affects the oil industry in two chief ways: (1) It establishes a relationship, based on common stock ownership, between the companies engaged in the different stages of the industry; production of crude oil, pipeline and tank-car transportation, refining, and marketing. This may be called industry-combination, or integration. (2) It brings together in common ownership potentially competitive companies engaged in the manufacture and sale of finished petroleum products, such as gasoline and kerosene.

INDUSTRY-COMBINATION AND ITS EFFECT ON COMPETITION.—Common ownership brings the various stages of the industry into a single community of interest, with the results outlined in the following section. For example, the Prairie Oil & Gas Co. is one of the leading Mid-Continent producers, and a majority of its stock is owned by the same individuals who own a majority of the stock of the Standard of New Jersey, Standard of New York, Standard of Indiana, Standard of Ohio, and the other Standard companies. The same is true of the Prairie Pipe Line Co. and some other pipe lines. The Carter Oil Co., another big producing company, is owned by the Standard of New Jersey, whose stockholders are largely identical with those of the other Standard companies. It is not the mere fact of the combination of the different branches of the industry that is emphasized here, but the fact that a group of companies which sell about 65 per cent of the country's gasoline are joined in common ownership of these branches.

There appears to be no economic necessity of monopoly in the petroleum-refining industry. Some tendency toward monopoly, however, seems to have arisen from the high degree of industry-combination, or integration, which has existed in the industry. The

integration referred to is seen in the fact that crude-oil production and storage, pipe-line and tank-car transportation, refining, and marketing of refined products all are combined in single business units. Integration in the petroleum industry involves: (1) Large fixed capital, the significance of which is increased by the risks of the crude-oil producing industry; (2) fixed and specialized investment in pipe lines, which resemble to some extent railway lines; (3) complex and expensive marketing organizations and equipment. As a result of the foregoing conditions, returns increase with volume of business up to a point where the business organization is very large. The fact that very large capital is required not only obstructs the entrance into the industry of effectively equipped competitors, but also tends to prevent active competition in prices which would jeopardize such large and specialized investments.

Not only is competition impeded in the way indicated in the preceding paragraph, but there is introduced a temptation to conceal and juggle accounts that is dangerous. Losses may be shown in any one of the branches while at the same time profits are taken wherever desired. Competitors in one branch may be "squeezed" between low prices on products and high prices on materials without affecting the industry-combination; and the more distinct, superficially, the branches are, the greater the danger. Thus, if the branches are entirely distinct in name and organization, while owned by the same interests, the danger of abuse is great and subtle.

The tendency toward monopoly that has come from integration, or industry-combination, in the petroleum industry is not associated equally with all the branches of the industry. It does not appear that crude oil production taken alone, or in connection with refining, is an industry that necessarily tends to monopoly. Crude oil is not, like some natural resources, confined to a small area, and up to the present time its production has been carried on by many independent firms. Foreign competition, too, is more of a potentiality. The business of the refiner, considered separately, is not one in which normal competition is impossible. The investment required is not so great as to restrict the flow of capital and enterprise into the business, and the history of the industry demonstrates that the small refinery, if given equal access to crude oil and to the market may thrive.

The effective marketing of gasoline and kerosene has required very large investments in tank steamers, tank cars, marketing stations, [1] tank wagons, etc. Barrel distribution, while still used to a limited extent, is not convenient nor economical where the gallonage sold is large. Inability to compete with an enormously expensive, all-per-

[1] The investment in marketing stations and equipment varies with the volume of business. In ordinary towns of from 1,000 to 5,000 population it runs from $2,000 to $3,000. The Standard of Indiana has an investment of nearly $200,000 in Indianapolis, and of over $1,500,000 in Chicago.

vading marketing machinery and organization has often placed the smaller jobber, or combination of jobber and refiner, at a disadvantage. The development of the industry in the Middle West, however, indicates that the small refiner and small jobber by cooperating can offer considerable competition to large industry-combinations like the Standard companies, The Texas Co., and the Gulf Oil Corporation, as long as the refiner has access to crude oil at reasonable prices and the jobber finds a reasonable market for his product.

In the petroleum companies which embrace the various branches of the industry, from oil production to the marketing of refined products, the chief factor tending to monopoly has been the pipe line.[1] It has been through the lack of pipe-line facilities that the growth of "independent" refiners has often been impeded,[2] and if, therefore, pipe lines were made available to all on reasonable and equal terms much of the danger to effective competition would be removed. So long, however, as the pipe lines are owned by companies engaged in other branches of the industry, or by the stockholders thereof, it will be very difficult to secure such reasonable and equal terms.

DIVISION OF TERRITORY AMONG NONCOMPETING REFINING AND MARKETING COMPANIES.—It has been urged upon the Commission that the several Standard companies constitute separate business units, most of which do not own oil-producing properties or pipe lines, and that in any case no one of them is large enough to dominate the markets of the country. This argument, however, appears to be largely, if not wholly, vitiated by the fact of the common ownership of the stocks of the several companies, and by the division of the country into separate marketing territories among which there is no effective competition in gasoline.

More direct than industry-combination in its effect upon competition is the community of interest among refiners and marketers which affects the sale of the refined products, notably gasoline and kerosene. That the country is divided among the several companies for the purpose of marketing gasoline and kerosene is a fact the effect of which upon competition must be considered. It has been shown that the several Standard companies do not compete with one another to any considerable extent in selling gasoline; in most cases each sells a controlling proportion of the total supply in its own territory, and its prices are followed by other companies: and great inequalities exist in the prices established in their several territories.

[1] See Report of the Federal Trade Commission on Pipe-Line Transportation of Petroleum, pp. 25, 26; Report of the Commissioner of Corporations on the Transportation of Petroleum, pp. 2-33, 36-37, 60-62; Report of the Interstate Commerce Commission on the Transportation of Petroleum, pp. 25, 6, 14; The Pipe Line Cases, 234 U. S. 548.

[2] Report of the Federal Trade Commission on Pipe-Line Transportation of Petroleum, pp. 26, 466.

It has been argued that the stockholders of the Standard companies do not exercise any influence upon the policies of the several companies, but leave the control entirely to the officers and directors. In view of the highly satisfactory earnings generally made by the Standard companies, and of the maintenance of a policy according to which they do not enter into competition with one another, noninterference of the stockholders would not be surprising. Such inactivity is common in large corporations. It is doubtful, however, if such noninterference would continue if one of the Standard companies were to enter into competition with another and the earnings of the two were to be reduced as a result of the establishment of lower prices.

It was recognized by those in control of the Standard companies that business units having a common ownership are not likely to compete. In the brief for the appellants, reported in the case of Standard Oil Co. *v.* United States (221 U. S., 8), which led to the dissolution of the Trust in 1911, it was argued as follows:

> Because of the common ownership of the different properties in interest, they were not independent or competitive but they were the constituent elements of a single business organism. * * * There is no warrant for the assumption that corporations engaged in the same business are naturally or potentially competitive regardless of their origin or ownership.

It is apparently as a result of the maintenance of a large degree of common ownership, therefore, that since the dissolution no substantial competition has arisen among the Standard companies.

Certain Standard companies sold gas and fuel oils, lubricating oils, and even kerosene to some extent, in the territories of other Standard companies, but the value of such sales, except for lubricating oils, was generally insignificant. So far as Standard companies were concerned, there was practically no competition in gasoline. It may be urged that the overlapping of territory of the Magnolia and Louisiana companies shows their readiness to compete. The extent of the competition, however, is too small to be significant (see p. 23), and merely tends to confirm the opinion that one Standard company might find it profitable to invade the territory of another—a proceeding the economic advantage of which was denied at the hearings held by the Commission on June 12 and 13, 1916.

As between the various Standard territories, great inequalities in price existed during 1915, varying from time to time, but not in accordance with costs of transportation or marketing, nor generally with differences in demand and supply (see pp. 57f., 113).

Again, considerable quantities of gasoline passed from one Standard territory to another; but the sales were made by one Standard company to another so as to minimize their tendency to equalize prices. This can only be understood when the common stock holding is borne

in mind. When sales can be made by one company at a profit to another company operating in another territory, it makes little difference to the common owners of these companies which company takes the profit. Thus, the Standard of Indiana sold nearly 38,000,000 gallons of gasoline in Ohio and some 12,000,000 gallons in Kentucky without appreciably reducing the margins between its prices and the prices in those States. At the same time the common stockholders received the advantage of a much higher "net back" on these sales than on those in Indiana territory (pp. 129, 130).

Finally, the territories, as they are now constituted, are illogical and wasteful. (See p. 6.) The president of one of the Standard companies, in a statement submitted to the Commission, writes:

> The fact, of course, is that the division of territory referred to was the plan adopted many years ago by the Standard Oil Co. of New Jersey, when it included the now independent organizations above referred to, * * * the present plan is both awkward and extravagant.

If the several companies were separate in ownership, the situation would be different in important respects: (1) When inequalities in price arise, they would constitute an incentive to companies in low-price areas to sell their products in competition with companies occupying high-price territories; (2) this would tend to break down the dominance of a single large company in each territory; and (3) it would tend to eliminate differences in prices, except as necessitated by differences in cost. For example, the Standard of Indiana would sell its gasoline not to the Standard of Ohio at the low price prevalent in Indiana territory, but would sell on its own account in Ohio at the highest price it could get, and this would tend to reduce prices in Ohio and equalize them with prices in Indiana territory. But as long as some 20 individuals, or closely related groups, hold in common over 50 per cent of the stock of these two companies, there will be little, if any, incentive to effective interterritorial competition. Single big companies will dominate in each territory, and price inequalities will exist among them.

That the various noncompetitive marketing territories are maintained as a result of collusion or combination in restraint of trade is not here charged; but in the absence of other convincing reasons, it may be concluded that the existence of a common body of majority stockholders in the several Standard companies, though it may be in accordance with the dissolution decree of 1911, has operated toward maintaining these territories.

Section 4. Arguments of Standard representatives in defense of the existing situation.

Representatives of various Standard companies, however, have presented explanations of the situation which should be considered.

1. It is argued that, as a purely business question, it is to the advantage of the several Standard companies not to enter into competition with other Standard concerns for the following reasons:

(*a*) Valuable customers—the other Standard companies with which they might enter into competition—would be lost.

(*b*) Reprisals and retaliations would be invited.

(*c*) Such large investments would be required that satisfactory returns could not be made.

(*d*) Better returns could be made by confining investments to the existing territories.

This line of argument is illustrated by the following excerpt from an oral statement made before the Commission by John G. Milburn, counsel for the Standard of New Jersey:

The problem of each body of management of each one of those companies, in regard to the future development or extension or expansion of that business, or locality of that business, was a question of business judgment. That is perfectly obvious. They had their business to do; they had their capacity of production; they had their resources. Whether they should branch out and go somewhere else, or add other territories to their business, besides developing the territory in which they were, depended upon a multitude of conditions which governed the determination of that question in each instance. We hear that they have not gone out and competed with each other, as if there was some idealistic plan which would govern a body of men succeeding to the management of one of those corporations; whereas the fact would be that every specific problem would have its own factors to be determined according to the advantage of the company. I have heard it said, for instance, "How easy for the Standard Oil Co. of New Jersey, which is not in the city of New York, to enter business in the city of New York." Well, now, look at that problem. It is a very short one. You know in this oil business there is one way of marketing, and that is by marketing stations. There is a good deal of confusion about that. And there is business outside of that, by carload lots, etc. But when we talk about certain companies marketing in certain States or Territories, what is meant by that is that they have a very large investment in a plant, which consists of real estate, stations, tankage, distributing wagons, and distribution routes.

Now, the Standard Oil Co. was a great wholesaler in the city of New York. It had no marketing plant there whatsoever, and never had. The city of New York is occupied by a number of marketing plants—the Standard of New York, the Gulf, The Texas, and others that I can not mention. There was a business question to decide. Would it throw up a large and lucrative or profitable wholesale business, and erect there, at a great expense, another marketing plant in a territory more than supplied with marketing facilities, and with a net result of a loss of advantage to the company itself?

Also the following statement by J. W. Van Dyke, president of the Atlantic Refining Co., is in point:

The problems confronting each of the newly created and independent concerns were undoubtedly different. We of course are competent to speak only for the Atlantic Refining Company, whose assets then consisted of large manufacturing plants, with comparatively small marketing equipment, no pipe lines, no rail or water transportation equipment, and no crude-oil producing territory. Moreover, their debts then due and payable exceeded their cash available to meet the same by

fully $6,000,000. These circumstances necessitated cautious procedure and precluded completely the undertaking of any new and untried enterprise involving appreciable investment.

They also made it vital that the company tenaciously retain any sources of revenue directly under their own control, which sources consisted only of their distributing station markets in Pennsylvania and Delaware. Even this effort required a large investment outlay, which expenditures during the four years 1912 to 1915, inclusive, have aggregated $1,689,774.37. This figure is cited for the purpose of showing that tank-wagon marketing can not be carried on in a territory previously well organized without large outlay for purposes other than routine operating expense, and we trust will make it clear to you that we are correct when concluding *that to enter and conduct a tank-wagon business in the State of New Jersey with the same thoroughness we do in Pennsylvania would require a plant investment on the part of the Atlantic Refining Co. of more than $2,000,000.* Of course we were in no position in 1912 to undertake this investment, and as our financial condition has improved since that time we have felt the necessity of investing our profits in directions which will insure the future existence of the company, such as oil-producing properties and tank ships for securing crude oils and disposing of export products.

The above is written under the assumption, not sustained by anything specifically stated in Prof. Haney's memoranda, that the Atlantic Refining Co. is under suspicion for declining to invade the States of New York, New Jersey, and Ohio with their tank-wagon delivery system. The argument against this procedure has been, as previously stated, the *disproportionate investment required in comparison with the results to be secured, and largely because equally good results can be had by offering our surplus products to the consumers in such territory through the medium of jobbers and merchants already established there*, and without the necessity of investment on our part.

There has been no time during the four years of our independent existence that we have not sold our products for delivery to the States adjacent to, and even remote from, Pennsylvania and to wholesale buyers other than the so-called Standard Oil companies in such outside territories. Even during the year 1915, when we were manufacturing barely enough gasoline to supply our own needs, we sold appreciable quantities to independent buyers, as above described.[1]

2. It is further implied that competition is undesirable from the public point of view for the reason that it would lead to duplication of plant.

3. The laws of various States, it is urged, tend to prevent entering into competition with companies in other States because of—

(*a*) The expense of qualifying to do business in another jurisdiction.

(*b*) Laws prohibiting foreign corporations from holding real estate.

(*c*) Laws prohibiting the organization of a domestic corporation with a name so similar to that of an existing company as to cause confusion and to deceive the public.

4. It is stated by some representatives that the Standard companies do compete, especially in the sale of certain products other than gasoline.

5. It is suggested that in the course of time the several Standard companies will come to compete with one another. The president of the Atlantic Refining Co. made the following statement:

Probably as the result of the operation of economic laws a territorial rearrangement will be brought about at some time in the future, but the process will be slow and

[1] The italics are the Commission's.

wasteful, and it will require disintegration and abandonment of the plant and equipment now operated at a disadvantage and its replacement by such one of the other concerns as may be in better position to occupy the field.

To take the foregoing points up in order:

(1) It appears that the first is equivalent to saying that it does not pay to compete, and in any case the Standard companies are not able to do so. That valuable customers are likely to be lost if a company which has supplied such "customers" enters into competition with them is apparent. This is a part of competition, and if the public interest demands competition a situation which makes most of the leading concerns in an industry "customers" of each other can not be defended on the ground that such customers would be lost.

That reprisals will be made in some cases is also likely, for that is but another way of saying that competitors will compete. In one important case, however, the statements of the representatives of Standard companies are in conflict. Thus a representative of the Standard of Indiana, said to the Commission:

> We have not considered it either necessary or wise to establish marketing stations in competition with our own customers, thus inviting reprisals by them. * * * As a trade proposition, how long would the Standard Oil Co. of Ohio continue to purchase our excess goods from us if it had to sell those same goods to the consumers in direct competition with us? * * * And all of this is aside from the question of reprisal.

On the other hand, A. P. Coombe, president of the Standard of Ohio, made the following statements in answer to questions:

> Question. Under those conditions you could not go into Indiana and compete?
> Answer. I couldn't make an 18-cent price in Indiana.
> Question. And it would not be good business judgment to try and go in there?
> Answer. No more than it is good judgment to suicide.

And W. H. Foster, vice president of the Ohio company, stated that—

> We have not enough gasoline to warrant our going over into neighboring States and marketing this product. In fact, the figures show that we have to buy gasoline to supply our stations in the State of Ohio.

As to the size of the investment required, it is admitted by the Standard of Indiana that in towns up to about 5,000 inhabitants the total investment is generally under $3,000, though it may run as high as $20,000. In five towns of between 11,000 and 13,000 inhabitants, located in Indiana, Michigan, Minnesota, and Missouri, the investment did not exceed $6,389 on July 30, 1916. In Sheboygan, Wis., a town of over 27,800, the investment was $11,264; and in South Bend, Ind. (65,000 population), the investment was $67,669. In short, while the investment required for a main distributing station may be considerable, the amount required at the mass of ordinary towns which make up the bulk of the market is not large. In comparison with the resources at the command of the Standard companies it is small.

Moreover, it is to be remembered that the Standard companies have found it profitable to make large investments in building up foreign trade in competition with other concerns, and that the Gulf, Indian, and other big "independents" continue to make the investments required to enter into competition with the Standard companies in their different territories.

It is misleading to speak of $2,000,000 being required to enter and conduct a tank-wagon business in a new State. This argument erroneously assumes that if a new territory is entered at all it must be occupied throughout with the same degree of thoroughness as in one in which a company is already established. It should not be necessary to occupy a whole State when a station is established therein. It would hardly be contemplated that a breaking down of the existing territory boundaries would require that each company forthwith occupy the new territory thoroughly at all points. Such is not the practice of those big "independents" which have at points competed with the Standard companies. And for the Atlantic Refining Co. to establish a tank-wagon station at a few profitable points in western New Jersey or southern New York, or for the Standard of Indiana to do likewise at points in western Ohio or northern Kentucky, would not require an investment beyond the means of these two great companies.

Underlying the whole reasoning of the point now under consideration is the assumption of a sort of proprietary interest in the business within certain areas—the existing marketing territories. This is seen in the constant reference to the alleged difficulty experienced by each Standard company in supplying its "own customers," meaning thereby those in a given territory. The representatives of the Standard companies do not appear to have seriously considered the abandonment of the old territories in which they found themselves, either for the purpose of establishing more logical territories or of engaging in business wherever a profit might be made, as do such companies as The Texas Co., Gulf Oil Corporation, Indian Refining Co., and National Refining Co.

(2) As to the social undesirability of plant duplication, the cost of such duplication is the price of competition, and, in the judgment of this Commission, in this industry competition is worth the price.

(3) The various State laws referred to are but minor obstacles, easily overcome by the large "independent" refining companies. Subsidiary companies might be formed to carry on the business in other States under another name.

(4) That there is some inconsistency between the statement that the territorial bounds have been observed because it would be unwise to compete, and the statement that the companies do compete, is apparent.

It has been demonstrated in this report that in the sale of their main product, gasoline, there is no substantial competition among the Standard companies in the United States. A competition which is confined to small and relatively unimportant branches of an industry and which works only when such products are not in such demand as to have a profitable market, is not satisfactory.

(5) In one argument it is suggested that "some time in the future" a redistribution of territory may be effected by the "operation of economic laws." Such a change is certainly to be desired, and the tendency of the existing system to give rise to inequalities in price has been demonstrated. That there is sufficient evidence of a tendency to any substantial rearrangement of territory to warrant a reliance upon time and the laws of trade to bring it about has not been demonstrated to this Commission. In any event, it is not desirable that any scheme of territorial division of markets, other than that which arises as a result of competition and cost limitations, should exist in this industry in the United States.

Section 5. The power of Standard companies to make prices—Testimony of competitors.

When it is stated that the several Standard companies generally make the market on gasoline in their territories, it is meant that the price which a Standard company adopts for the sale of its products usually becomes the prevailing price in the territory which it occupies. This is true because, with one or two exceptions, in each territory the particular Standard company sells so large a part of the gasoline (so very much larger than any one of its competitors can sell) that its competitors can not be expected to depart very long from the price it adopts.

It may be that in naming their prices the Standard companies consider the fact that some of their competitors are cutting prices or advancing them, as the case may be; but if the competitors are small and have only a limited supply, no one of these competitors can fix and maintain a price.

There are 11 Standard concerns marketing gasoline direct in the United States. Now these large companies, each in its own sphere, confront numerous small competitors. Counsel for the Indiana company stated before the Commission that there were 58 independent refineries selling in Indiana territory alone. Certainly there were scores of jobbers. Though there is less competition in most of the other Standard territories, the same general conditon exists. If these "independent" jobbers combine to fix prices, they come under the ban of the law. If they compete singly, they must do so at the sufferance of the one big company; for they obviously can not advance their prices without its acquiescence, and if they reduce the price it can ruin them by fixing its price below their cost. Under such circumstances it is but natural that the Standard companies make the market.

An apparent exception to this conclusion serves to illustrate the rule. The Texas Co. and the Gulf Oil Corporation are as big as some of the Standard concerns. Backed by large capital, they have followed the Standard companies' policy of combining the different stages of the industry into one organization, including the export business. Furthermore, they possess the decisive advantage of doing business in two or more different Standard marketing territories. Thus they are able to reap the advantage of the high prices they find in some. They can compete in one territory without sacrificing their profits in another. The general counsel for The Texas Co. in a brief submitted to this Commission uses the following significant language:

> I have not undertaken to discuss the fact that prices in some sections are out of line with prices in other sections when cost of production, manufacture, and transportation are taken into consideration. My company has had nothing to do with bringing about such disparity. It has taken conditions as it found them, and among other things has found it necessary to meet prices of competitors in order to sell its goods. In the past it has often happened that gasoline has been sold without profit or even at a loss in certain localities. This was done because it was necessary to maintain the organization in those localities and keep in contact with the trade. Otherwise it would have been an easy matter for a strong competitor to accomplish a monopoly. One vital benefit of having several strong companies in the business is that when one institutes a price which is below cost the others will not disappear from the market, but will hold on and fight for the future. Nothing could be more simple for a strong company than to do away with weak competitors by selling for a time at a loss. In support of this assertion it is only necessary to recall the old days of the Standard Oil Co.

That is to say, a company which can compete at one point, while enjoying good prices at another, can survive; and smaller companies which are limited to a single territory are likely to be forced to the wall by price reductions.

The relative size and large volume of business of the Standard companies help them to establish the tank-wagon market that prevails, not only directly but indirectly through their relation to producers and pipe lines and through their influence upon refining prices. The Standard companies being the largest purchasers of crude oil and its products, to say nothing of being owned in common with producing and pipe-line interests, their tank-wagon prices on refined products are very closely related to the price of crude oil and refinery prices of products. When a Standard company reduces or raises its wholesale (tank-wagon) price on gasoline that exerts a powerful influence on the refinery price of gasoline, and this influence may be transmitted to the posted price of the refineries' raw material, crude oil, through the quotations of the Prairie Oil & Gas Co. or other purchasing agency. These prices of crude affect the costs of other refiners, while their refinery prices are at the same time affected by the Standard's refinery price. Thus the small refiner or jobber—and the small refiner generally has to sell through jobbers—finds his costs made for him, and his price must follow.

The testimony before the Commission at its hearings on June 12 and 13, 1916, clearly shows that the market price of gasoline is generally established by the Standard companies. Testimony by R. L. Welch, general counsel of the Western Oil Jobbers' Association, is in point:

Question. I do not suppose you wish to be understood that you have any agreement to fix prices, but that you follow the prices fixed by the Standard?

Answer. It is not necessary to have an agreement; economic conditions compel that action.

Question. Would you explain that and say just what you mean by economic conditions?

Answer. Well, if you had 500 stations in the Middle West buying gasoline from the refiner you would find that the refiner would mark up his price when the Standard Oil Co. marked up its tank-wagon market; that is to say, if the Standard advances 1 cent, the refiner in the mid-continent field would mark up his price 1 cent. Consequently he [the jobber] would have to get 1 cent more for his goods than prior to the advance. There is nothing he could do in view of the fact that the wholesale cost had advanced except to advance his market.

The various western jobbers who appeared before the Commission stated that they generally followed the Standard's tank-wagon market, in some cases receiving information from the local Standard agent as to changes made.

Mr. Welch, general counsel for the Western Oil Jobbers' Association, also made the following statement:

I don't believe there is a jobber in our organization who can survive who does not follow the market of the Standard Oil Co., and so far as I am concerned I would advise them to do so.

Question. They have followed the Standard market?

Answer. Substantially, yes.

Question. Have any risen above the Standard market?

Answer. Occasionally here and there some one has risen above it, but whenever he has done it he has lost enough gallonage to get his lesson.

* * * But over a large section of the country like, for instance, in the territory in which Mr. Collins operates, several hundred stations, I regard it as absolutely futile for Mr. Collins to try to sell his oil for a cent above the Standard Oil Co. On the other hand, if he sold below them, they would meet his price. The Standard Oil Co. is in control of the tank-wagon market, and we all recognize it, and I am frank to say if we could form an organization legally which would observe the Standard Oil Co.'s market I would advise our members to join it, for the simple reason we can not have economic peace under the present conditions with a stronger competitor unless we try to meet their prices.

A. L. Beaty, general counsel for The Texas Co.,[1] when asked if his company followed the Standard prices, said:

I should say as a rule we do. Now and then we take the initiative and make a price higher or lower, but as a rule we follow the Standard's prices, or the subsidiaries of the former Standard. * * * I think the Standard Oil Co. is the competitor who usually raises or lowers the price.

H. G. James, secretary of the Western Refiners' Association, made a similar statement on this subject. The question put was: "Does

[1] In 1915 over 20 per cent of the Texas Company's stock was owned by stockholders in Standard companies.

the Standard of Indiana make the tank-wagon price, generally speaking, and do the independent jobbers follow that price?" His answer was: "Yes, sir; generally speaking."

The representatives of the Standard of Indiana themselves use language which indicates a recognition of their leadership in making prices (see above, p. 126).

Section 6.—Territorial division and the dissolution decree.

As was observed on page 5 of this report, common ownership of the several companies was not prohibited by the decree of dissolution. It was specifically provided in the decree[1] as follows:

> But the defendants are not prohibited by this decree from distributing ratably to the shareholders of the principal company the shares to which they are equitably entitled in the stocks of the defendant corporations that are parties to the combination.

Thus shares in each of the subsidiary companies were given to each of the shareholders of the Standard of New Jersey, and the combination ceased to be a combination in the form of a holding company.

But it did in fact, if not in law, remain a combination—one that may be called a community of interest. Certainly the majority of the companies have a majority of their stock held by a relatively small number of individuals and allied interests; the territories as established have been carefully maintained. It will be remembered that the Supreme Court stated as one evidence of intent to monopolize "the system of marketing which was adopted by which the country was divided into districts and the trade in each district in oil was turned over to a designated corporation within the combination and all others were excluded."[2]

There is no more than a negligible degree of competition in the sale of gasoline between the various Standard companies which occupy the several "territories." If it is to be assumed that the several Standard companies might compete with one another in the sale of their chief products in the United States, to the advantage of the public, then the existing situation is undesirable.

It is not the purpose of the foregoing paragraphs either to criticize the dissolution decree or to accuse the Standard companies severally or collectively of violating that decree. The decree may be regarded as an experiment. The companies concerned claim to have strictly followed the letter of the decree, and have ever acted upon advice of counsel. Aside from technical questions concerning the means, however, it is the Commission's judgment that in the oil industry the experiment of dissolving corporations without separating owners has not achieved the purpose of establishing effective competition.

[1] See U. S. *v.* Standard Oil Company of New Jersey, 173 Fed. Rep. 177, 199, sec. 5 (Nov. 20, 1909). The decree was upheld with unimportant modifications by the Supreme Court in 1911, 221 U. S. 1.

[2] 221 U. S. 77.

CHAPTER VIII.

CONCLUSIONS AND RECOMMENDATIONS.

Section 1. Summary of facts and conclusions.

Briefly restated, the Commission's chief findings of facts in the gasoline situation and the conclusions based thereon are as follows:

SUPPLY, DEMAND, AND PRICES.

The demand for gasoline as measured by consumption has increased, and was about 38 per cent greater in 1915 than in 1914. The supply did not increase in proportion, the quantity of gasoline and naphtha manufactured in 1915 being 31 per cent greater than in 1914. The difference between production and sales was covered by decreases in stocks of gasoline. As a result the general level of prices in 1915 was necessarily and naturally somewhat higher than in 1914.

This conclusion, however, does not indicate how much higher the price of gasoline should have been on the basis of strictly competitive conditions, nor does it indicate when and where the advances required by such conditions should have taken place.

Cost figures for representative refiners indicate that the margins in December, 1915, were from about 1 to 3 cents per gallon greater than in July. (See pp. 91–94, 80–82.) That is to say, while costs increased, prices increased much more, with the result that in general the refiners were making much larger net returns per gallon of gasoline in December than in July or in August. This fact is reflected in the larger net earnings in 1915 of the principal refining companies and the increased stock-exchange quotations on the securities of such companies toward the end of that year.

While prices advanced rapidly in all parts of the country between September and December, 1915, the movement of prices to September was irregular, in some cases declining, in others rising, and in still others remaining nearly stationary. The rise between September and December was general, but was more rapid in some localities than in others. In relation to cost, the prices were much lower in some sections of the country than in others, as shown in the difference in margins per gallon of gasoline made by refiners in different localities.

These differences have this in common: They all correspond to certain areas described in this report as Standard marketing territories. Within such territories the price of gasoline moved with practical uniformity. Between them there were wide differences.

DIVISION OF TERRITORY AND COMMUNITY OF OWNERSHIP.

These marketing territories were established long ago and with little reference to the gasoline business. They bear little relation to the areas that would be adapted to the most economical marketing of gasoline (see p. 150), a fact conclusively proved by the large inter-territory sales among Standard companies and the conduct of profitable business by "independent" companies within the area embraced in these territories but with very different boundaries. This correspondence of the differences in prices with Standard marketing territories in itself points to arbitrary price making. But the arbitrary character of the inequalities in price is conclusively demonstrated by the facts (1) that as between most of the territories there were no such differences in demand or supply as would explain the frequent and unequal variations in prices, and (2) that the margin between cost and price was widely different in the different territories.

These territories, if they should continue to exist, would have a significance different from that they now possess if they were occupied by companies which were separately owned. As a matter of fact, the several Standard companies are interrelated through a common body of majority stockholders.

Throughout this report it has been apparent that the maintenance of different markets for gasoline by companies among which there exists a substantial community of ownership has been of fundamental importance in the gasoline situation. This condition should be modified.

PIPE LINE CONTROL.

In the Federal Trade Commission's Report on Pipe-Line Transportation of Petroleum, and in the preceding chapter of this report, it has been shown that control of pipe lines has been a decisive factor in giving certain large refining interests advantages over their competitors. The combination of pipe lines with the other branches of the industry in single business organizations has tended to establish and perpetuate monopoly. To be sure, three or four large competitors exist; but the history of their operations appears to indicate that, after a preliminary competitive onslaught in which a fairly satisfactory amount of business is gained, they "dig themselves in," to use a military metaphor, and thereafter "follow the Standard market." It is noteworthy that those districts in which The Texas Company and the Gulf Refining Company were engaged in business along with the Standard companies were by no means always the places where prices of gasoline were low in 1915.

If competition is to be effective in the business of refining petroleum and marketing petroleum products, the pipe lines which are necessary for transporting the raw material, crude oil, must be made available

to all refiners on equal and reasonable terms both as to rates and service. It has been decided by the courts that pipe lines are common carriers and as such are subject to the control of the Interstate Commerce Commission. It may be that in time their rates of charge and conditions of service will be so regulated as to be just and equal to all producers and refiners. Such regulation, however, has not yet been tested, and, in view of the differences between pipe-line transportation and railway transportation, its effectiveness is problematical. The analogy of the coal carriers and of the "commodities clause," suggests that it would be desirable to effect a complete separation of the ownership of the pipe lines from the ownership of the oil which they transport, and that a law to that effect is feasible. It is generally recognized that when the carrier is identified with certain shippers it is very difficult to prevent rates and conditions which are equivalent to discrimination, and the Interstate Commerce Commission has repeatedly called attention to this difficulty.

PUBLICITY OF CORRECT STATISTICS.

A powerful agency for insuring a just balance of supply and demand—for eliminating violent fluctuations in price—is knowledge of conditions. This truth is well illustrated by advantages gained from the statistics of crops compiled by the Department of Agriculture and even from the statistics of live-stock receipts from private sources. Such statistics concerning the petroleum industry as are now available are not satisfactory. Information on vital points does not appear on time and the data are regarded with suspicion by many "independent" oil men.

Several statements on this subject were made to the Commission at one of its hearings, excerpts from which follow. A jobber said:

> I suppose it cost me $50,000 last year (1915) for lack of knowledge. If we had had any way to know the crude conditions, we could have protected ourselves in the market. * * * If there had been knowledge at our hand of the falling off of the production at Cushing, we would not have been caught with such a small amount of supplies. The other people who have greater knowledge of the situation could reduce their price on the 10th of June and make us think that the production was increasing and there was going to be still cheaper gasoline. * * * Now, if we had statistics in the oil business that gave bona fide statements, we could then know what the runs were every day, and we could tell what the stocks on hand were every day, all of which would tend to create a more solid condition in the oil business.

Another jobber said:

> It seems to me that the statistics available in the oil business are very meager indeed. * * * But if it were possible to get government statistics, brought fairly well up to date, as to the production of gasoline, if you please, and the shipments of gasoline, and the volume going into the different territories, and the stocks of distillates of benzine on hand, it seems to me that would be of very measurable help.

The citations are of interest, not only as showing the need, but as indicating the character of information needed.

As to the means of securing the information, it is clear that it should devolve upon some branch of the Federal Government to collect and publish pertinent statistics.

QUALITY OF GASOLINE.

As indicated in this report, the quality of gasoline is difficult of measurement and has probably deteriorated during recent years. Various products, all called gasoline, are sold under a common name, and the result is confusion in which inferior qualities may be sold at the price of superior ones. There has been a trend toward putting on the market blended products which often contain such quantities of nonvolatile (high boiling point) products as to give very unsatisfactory results in the more important classes of gasoline engines.

Section 2. Recommendations.

The recommendations and suggestions of the Commission concerning the foregoing matters are as follows:

(1) AS TO COMMON OWNERSHIP.

I. With respect to the application of the present antitrust laws, the Commission makes the following findings, and has taken action thereon as prescribed by law.

The Commission finds:

(1) That the several Standard companies have maintained a distribution of territory in the marketing of gasoline, and that no substantial competition in the chief petroleum products exists among the several Standard companies.

(2) That this absence of competition is due to a community of stock ownership, which community of interest is the result of the ratable distribution of stock under the dissolution as ordered by the court.

(3) That the facts disclose such advances in prices of gasoline and such differences in price corresponding to Standard marketing territories as are not possible of explanation apart from the foregoing conditions.

(4) The Commission has found no direct evidence of collusion among the several Standard companies in violation of the dissolution decree.

Section 6 (c) of the Federal Trade Commission act provides that the commission shall have power—

> Whenever a final decree has been entered against any defendant corporation in any suit brought by the United States to prevent and restrain any violation of the antitrust acts, to make investigation, upon its own initiative, of the manner in which the

decree has been or is being carried out, and upon the application of the Attorney General it shall be its duty to make such investigation. It shall transmit to the Attorney General a report embodying its findings and recommendations as a result of any such investigation, and the report shall be made public in the discretion of the commission.

The Commission's findings, together with the evidence, have, therefore, been submitted to the Department of Justice for its consideration and for such action, if any, as it may deem advisable under existing law.[1]

II. With a view to preventing or remedying such conditions as obtain in the oil industry, the Commission suggests various plans for legislation, as follows:

(1) A law providing for the reopening of antitrust cases on the application of the Attorney General by a bill of review for the purpose of securing such modifications of decrees as new conditions may require.

(2) Abolition, by legislation, in certain cases, of common stock ownership in corporations which have been members of a combination dissolved under the Sherman Law.

(3) Effective limitation upon common ownership of stock in potentially competitive corporations by withdrawing the power of voting and control.

(4) Legislation which, while recognizing common ownership, would fix upon such common owners the responsibility for the acts of each of the several companies so owned, which prevent competition.

As to (1).—It is suggested that there be added to paragraph (*c*) of Section 6 of the Trade Commission Act a proviso to cover all cases in antitrust suits where there apparently has been a technical compliance with the decree but in which for any reason the decree has not been effective. Such law should provide generally that in any case where the findings of the Trade Commission reveal no such violation of the

[1] Section 6 of the dissolution decree (U. S. *v.* Standard Oil Co., 173 Fed., 199-200), provides as follows:

"SEC. 6. That the defendants named in section 2 of this decree, their officers, directors, agents, servants, and employees, are enjoined and prohibited from continuing or carrying into further effect the combination adjudged illegal hereby, and from entering into or performing any like combination or conspiracy, the effect of which is, or will be, to restrain commerce in petroleum or its products among the States, or in the Territories, or with foreign nations, or to prolong the unlawful monopoly of such commerce obtained and possessed by defendants as before stated, in violation of the act of July 2, 1890, either (1) by the use of liquidating certificates, or other written evidences of a stock interest in two or more potentially competitive parties to the illegal combination, by causing the conveyance of the physical property and business of any of said parties to a potentially competitive party to this combination, by causing the conveyance of the property and business of two or more of the potentially competitive parties to this combination to any party thereto, by placing the control of any of said corporations in a trustee, or group of trustees, by causing its stock or property to be held by others than its equitable owners, or by any similar device, or (2) by making any express or implied agreement or arrangement together, or one with another, like that adjudged illegal hereby relative to the control or management of any of said corporations, or the price or terms of purchase, or of sale, or the rates of transportation, of petroleum or its products in interstate or international commerce, or relative to the quantities thereof purchased, sold, transported, or manufactured by any of said corporations, which will have a like effect in restraint of commerce among the States, in the Territories, and with foreign nations to that of the combinations the operation of which is hereby enjoined."

decree as would constitute a ground for contempt proceedings, but which show that the decree has failed to bring about competitive conditions, the Attorney General shall have power and it shall be his duty to embody such findings and recommendations in a bill of review to be filed in the court entering the decree; and such law should further provide that upon the filing of such bill of review the court shall reopen the suit and take further testimony touching the efficacy of the decree in bringing about competitive conditions. The findings of the Trade Commission should be made admissible as evidence. Such law should further provide that on proof the court shall have power to amplify and modify the decree in such manner as may be necessary fully to restore competitive conditions.

As to (*2*).—It is suggested that the evils growing out of common ownership may be successfully prevented by legislation declaring it to be unlawful for any person to own, directly or indirectly, shares of stock in more than one of the companies into which a combination in the form of holding company or consolidated corporation (except railroad combinations) has been dissolved under the Sherman law, whenever such companies are engaged in the same line of commerce. In other words, to enact into law the doctrine as to diverse ownership of competing corporations which has been laid down by the courts in the Union Pacific, Reading, and other recent cases.

As to (*3*).—It is suggested that instead of forbidding absolutely common ownership, the same effect may probably be reached by withdrawing entirely from such owners the right to vote or hold office or otherwise exercise power of control, whether the same is done directly or indirectly. Such withdrawal of rights might even be extended to the right to receive benefits and earnings. It might be made applicable to all potentially competitive corporations.

As to (*4*).—If it is deemed inadvisable by Congress to prevent common ownership, with its almost inevitable restriction of competition, it is suggested that legislation might be enacted fixing upon the common owners of stock in potentially competing concerns the responsibility for the acts of such corporations, so owned, which result in the prevention of competition or the abolition of competitive conditions.

(2) AS TO PIPE LINE CONTROL.

As to pipe lines, it is the opinion of this Commission that it would in the long run be the simplest and most effective policy to segregate the ownership of the pipe lines from the other branches of the petroleum industry. This would mean that no controlling portion of the stock of any pipe-line company engaged in interstate commerce should be owned by any individual, company, or corporation; or by any group of individuals, companies, or corporations, that are also interested as owners in any oil producing or refining properties; and vice versa.

(3) AS TO PUBLICITY OF STATISTICS.

In view of the bearing of accurate information upon industry and competitive conditions, it is suggested that an appropriate branch of the Federal Government should be provided with adequate means for carrying on the statistical work required. It is of the utmost importance that the work be performed with integrity, accuracy, and dispatch. It is believed that (independently of any remedies that may be adopted to secure a more competitive organization of industry) to make available currently the statistical information here contemplated would go far toward preventing such abnormal and unequal price advances as occurred in the gasoline markets of the United States in 1915.

(4) AS TO QUALITY OF PRODUCT.

With regard to quality of product, the Commission suggests the desirability of classifying gasoline products. It is a simple matter to ascertain what proportion of a sample of gasoline is sufficiently volatile to insure the reasonably easy starting and flexibility of operation of the ordinary internal combustion engine. If a law were enacted which would provide that only such petroleum products as contain the desired proportion of sufficiently volatile elements shall be sold in interstate commerce as gasoline, it is believed that it would lead to a desirable measure of classification and uniformity in quality.

STATISTICAL EXHIBITS.

PART 1.

INDEPENDENT REFINERS AND JOBBERS COVERED BY THE REPORT.

REFINERS.

Adeline Oil Co., Maricopa, Cal.
American Oriental Oil Co., San Francisco, Cal.
American Refining Co., Okmulgee, Okla.
Ardmore Refining Co., Tulsa, Okla.
Associated Oil Co., San Francisco, Cal.
Barber Asphalt Paving Co., Philadelphia, Pa.
Beaver Refining Co., Washington, Pa.
Butler County Oil Refining Co., Bruin, Pa.
California-Fresno Oil Co., Fresno, Cal.
Canfield Oil Co., Cleveland, Ohio.
Capital Crude Oil Co., Santa Paula, Cal.
Central Refining Co., Lawrenceville, Ill.
Chanute Refining Co., Chanute, Kans.
Clarendon Refining Co., Clarendon, Pa.
Conewango Refining Co., Warren, Pa.
Constantin Refining Co., Tulsa, Okla.
Consumers Refining Co., Chicago, Ill.
Continental Gas Compressing Corporation, New York, N. Y.
Continental Refining Co., Bristow, Okla.
Continental Refining Co., Oil City, Pa.
Cornplanter Refining Co., Warren Pa.
Cosden & Co., Tulsa, Okla.
Craig Oil Co., Toledo, Ohio.
Crew Levick Co., Philadelphia, Pa.
Crystal Oil Works, Oil City, Pa.
Cudahy Refining Co., Chicago, Ill.
Cushing Refining Co., Oklahoma City, Okla.
Dallas Oil & Refining Co., Dallas, Tex.
Daugherty & Sons Refining Co., Petrolia, Pa.
Densmore-Stabler Refining Co., Los Angeles, Cal.
Elk Refining Co., Charleston, W. Va.
Emery Manufacturing Co., Bradford, Pa.
Empire Oil Works, Oil City, Pa.
General Petroleum Co., Los Angeles, Cal.
Germania Refining Co., Oil City, Pa.
Great Western Oil Refining Co., Erie, Kans.
Gulf Refining Co., Pittsburgh, Pa.
Hercules Oil Refining Co., Los Angeles, Cal.
Independent Refining Co., Oil City, Pa.
Indian Refining Co., New York, N. Y.

Indiahoma Refining Co., St. Louis, Mo.
International Refining Co., Tulsa, Okla.
Interocean Oil Co., New York, N. Y.
Island Petroleum Co., Baltimore, Md.
Kanotex Refining Co., Caney, Kans.
Kansas Cooperative Refining Co., Chanute, Kans.
Kansas Oil Refining Co., Coffeyville, Kans.
Leader Oil Co., Casey, Ill.
Liberty Oil Co., Ltd., New Orleans, La.
Louisiana Oil Refining Co., Shreveport, La.
Midcontinent Refining Co., Tulsa, Okla.
Midwest Refining Co., Denver, Colo.
Miller Petroleum Refining Co., Chanute, Kans.
Milliken Refining Co., St. Louis, Mo.
Muskogee Refining Co., Muskogee, Okla.
Mutual Refining Co., (Ltd.), Warren, Pa.
National Refining Co., Cleveland, Ohio.
Northwestern Oil Refining Co., Billings, Mont.
North American Refining Co., Oklahoma City, Okla.
Oklahoma Refining Co., Oklahoma City, Okla.
Oriental Oil Co., Dallas, Texas.
Paragon Refining Co., Toledo, Ohio.
Pennsylvania Oil Products Refining Co., Eldred, Pa.
Petroleum Products Co., Chicago, Ill.
Phoenix Refining Co., Tulsa, Okla.
Pierce Oil Corporation, St. Louis, Mo.
Pierce-Fordyce Oil Association, Dallas, Tex.
Pinal-Dome Refining Co., Santa Maria, Cal.
Ponca Refining Co., Oklahoma City, Okla.
Producers Refining Co., Bakersfield, Cal.
Puente Oil Co., Los Angeles, Cal.
Pure Oil Co., Philadelphia, Pa.
Riverside Oil Co., Pittsburgh, Pa.
Sapulpa Refining Co., Sapulpa, Okla.
Seneca Oil Works, Warren, Pa.
Shell Co. of California, San Francisco, Cal.
Shreveport Refining Co., Shreveport, La.
Sun Co., Philadelphia, Pa.
Sun Oil Co., Toledo, Ohio.
Superior Oil Works (Ltd.), Warren, Pa.
The Texas Co., Houston, Tex.
Tide Water Oil Co., New York, N. Y.
Tiona Refining Co., North Clarendon, Pa.
Titusville Oil Works, Titusville, Pa.
Union Oil Co. of California, Los Angeles, Cal.
Union Petroleum Co., Philadelphia, Pa.
United Refining Co., Warren, Pa.
Ventura Refining Co., Los Angeles, Cal.
Warren Refining Co., Warren, Pa.
Waverly Oil Works Co., Pittsburgh, Pa.
Webster Oil & Gasoline Co., Yale, Okla.
Wellsville Refining Co., Wellsville, N. Y.
Wilburine Oil Works (Ltd.), New York, N. Y.
Yosemite Oil Refining Co., Los Angeles, Cal.

JOBBERS.

American Oil & Gasoline Co., Hutchinson, Kans.
Aurora Oil Co. (Inc.), Aurora Ill.
Automobile Gasoline Co., St. Louis, Mo.
W. H. Barber Agency Co., Minneapolis, Minn.
Barkhausen Oil Co., Green Bay, Wis.
Bartles Oil Co., St. Paul, Minn.
Bartles-Maguire Oil Co., Milwaukee, Wis.
Bartles Northern Oil Co., Grand Forks, N. Dak.
Bartles-Scott Oil Co., Willmar, Minn.
Bartles-Sweney Oil Co., Peoria, Ill., and Waterloo, Iowa.
Bell Oil Co., St. Louis, Mo.
Blake Oil Co., Liberal, Kans.
Carthage Oil & Fuel Co., Carthage, Mo.
Central Oil Co., Detroit, Mich.
Charleston Oil Co., Charleston, S. C.
Climax-Western Oil Co., Minneapolis, Minn.
Collins, S. L., Co., Knoxville, Iowa.
Cunningham, R. G., Oil Co., Miami, Okla.
Economy Oil Co., Charleston, S. C.
Elmore Oil Co., Sycamore, Ill.
Evansville Oil Co., Evansville, Ind.
Gaffill Oil Co., South Bend, Ind.
Gerkins Oil Co., Dayton, Ohio.
Grand Rapids Oil Co., Grand Rapids, Mich.
Great Western Oil Co., Cleveland, Ohio.
Greenslade Oil Co., Detroit, Mich.
Hawkeye Oil Co., Waterloo, Iowa.
Herring Motor Co., Des Moines, Iowa.
Hughes Oil Co., Glendive, Mont.
Illinois Independent Oil Co. of Illinois, Lincoln, Ill.
Independent Oil Co., Maryville, Mo.
Independent Oil Co., De Kalb, Ill.
Independent Oil Co., Kalamazoo, Mich.
Independent Oil & Merchandise Co., Kahoka, Mo.
Interstate Oil Co., La Crosse, Wis.
Iowa Oil Co., Dubuque, Iowa.
Jordan Oil Co., Los Angeles, Cal.
Kelly Supply Co., Brimfield, Ill.
Kentucky Consumers Oil Co., Louisville, Ky.
Kentucky Independent Oil Co., Covington, Ky.
Keystone Oil & Manufacturing Co., Chicago, Ill.
Laporte Independent Oil Co., Laporte, Ind.
Leader Oil Co., Dubuque, Iowa.
McCornack, C. S., St. Charles, Ill.
Manhattan Oil Co. of Iowa, Des Moines, Iowa.
Manhattan Oil & Linseed Co., St. Paul, Minn.
Marshall Oil Co., Marshalltown, Iowa.
Merchants Oil Co., Cincinnati, Ohio.
Moberly Oil Co., Moberly, Mo.
Moore Oil Co., Cincinnati, Ohio.
Mutual Oil Co., Kansas City, Mo.
Nicholas, L. V., Oil Co., Omaha, Nebr.

Oil Marketing Co., Chicago, Ill.
O'Neil Oil & Paint Co., Milwaukee, Wis.
Pennolene Oil Co., Colby, Kans.
Pennsylvania Oil Co., Freeport, Ill.
Pennsylvania Oil Co., Dixon, Ill.
People's Oil Co., Augusta, Ga.
Pioneer Oil Co., Muskogee, Okla.
Poole Bros., Rexburg, Idaho.
Red "C" Oil Mfg. Co., Baltimore, Md.
Refiners Oil Co., Dayton, Ohio.
Richardson Lubricating Co., Quincy, Ill.
Riley Pennsylvania Oil Co., Burlington, Iowa.
Salina Oil Co., Salina, Kans.
South Bend Oil Co., South Bend, Ind.
Spiegler Oil Co., Chicago, Ill.
Stoessel Oil Works, Ottumwa, Iowa.
Topeka Oil Co., Topeka, Kans.
Wadhams Oil Co., Milwaukee, Wis.
Western Oil Station, Sapulpa, Okla.
Van Tilburg Oil Co., Minneapolis, Minn.
White Star Oil Co., Eaton, Ohio.
Wichita Independent Oil Co., Wichita, Kans.
Yapp Oil Co., Fond du Lac, Wis.

PART 2.

Data upon which diagrams showing price inequalities are based:

TABLE 1.—DATA UPON WHICH DIAGRAM 1, FACING PAGE 115, IS BASED, TOGETHER WITH INFORMATION CONCERNING COSTS, COMPETITION, AND KIND OF GASOLINE MARKETED AT SPECIFIED POINTS.

[Cents per gallon.]

Various Standard Oil companies and marketing points.	Tank-wagon price.	Freight rate.	Tank-wagon price less freight rate.	Discount on large quantities.	Net tank-wagon price less freight rate.	Chief competitors.
New York City (Standard of New York):						
Jan. 11	12.00	0.15	11.85	.....	11.85	Gulf Refining Co.
July 27	13.00	.15	12.85	.....	12.85	Pure Oil Co.
Aug. 16	14.00	.15	13.85	.....	13.85	The Texas Co.
Aug. 30	15.00	.15	14.85	.....	14.85	
Sept. 6	16.00	.15	15.85	.....	15.85	
Oct. 8	17.00	.15	16.85	.....	16.85	
Nov. 3	18.00	.15	17.85	.....	17.85	
Nov. 22	19.00	.15	18.85	.....	18.85	
Dec. 9	20.00	.15	19.85	.....	19.85	
Dec. 20	21.00	.15	20.85	.....	20.85	
Columbus, Ohio (Standard of Ohio):						
Jan. 1	12.00	.63	11.37	.....	11.37	National Refining Co.
Jan. 20	11.00	.63	10.37	.....	10.37	Central Ohio Oil Co.
June 16	10.00	.63	9.37	.....	9.37	Moore Oil Co.
Aug. 23	10.50	.63	9.87	.....	9.87	F. E. Avery & Son.
Sept. 9	11.00	.63	10.37	.....	10.37	
Sept. 15	12.00	.63	11.37	.....	11.37	
Sept. 30	12.50	.63	11.87	.....	11.87	
Oct. 23	14.00	.63	13.37	.....	13.37	
Nov. 16	15.00	.63	14.37	.....	14.37	
Nov. 20	16.00	.63	15.37	.....	15.37	
Dec. 8	17.00	.63	16.37	.....	16.37	
Dec. 21	18.00	.63	17.37	.....	17.37	
Pittsburgh, Pa. (Atlantic Refining Co.):						
Jan. 1	10.00	.....	10.00	.....	10.00	Gulf Refining Co.
Aug. 16	11.00	.....	11.00	.....	11.00	Freedom Oil Works Co.
Sept. 1	12.00	.....	12.00	.....	12.00	Waverly Oil Works Co.
Sept. 20	13.00	.....	13.00	.....	13.00	Petroleum Products Co.
Nov. 1	14.00	.....	14.00	.....	14.00	Gasoline Supply Co.
Nov. 18	15.00	.....	15.00	.....	15.00	
Dec. 6	16.00	.....	16.00	.....	16.00	
Dec. 14	17.00	.....	17.00	.....	17.00	
Omaha, Nebr. (Standard of Nebraska):						
Jan. 1	11.50	.86	10.64	.....	10.64	National Refining Co.
Feb. 1	11.00	.86	10.14	.....	10.14	Manhattan Oil Co.
Feb. 15	10.75	.86	9.89	.....	9.89	Missouri Valley Oil Co.
Mar. 17	10.25	.86	9.39	.....	9.39	Cudahy Refining Co.
Mar. 27	10.00	.86	9.14	.....	9.14	L. V. Nicholas Oil Co.
Sept. 16	11.00	.86	10.14	.....	10.14	
Sept. 29	11.50	.86	10.64	.....	10.64	
Oct. 25	12.50	.86	11.64	.....	11.64	
Nov. 3	13.00	.86	12.14	.....	12.14	
Nov. 16	14.00	.86	13.14	.....	13.14	
Nov. 20	15.00	.86	14.14	.....	14.14	
Dec. 14	16.00	.86	15.14	.....	15.14	
Dec. 20	16.50	.86	15.64	.....	15.64	
Dec. 28	17.50	.86	16.64	.....	16.64	

TABLE 1.—DATA UPON WHICH DIAGRAM 1, FACING PAGE 115, IS BASED, TOGETHER WITH INFORMATION CONCERNING COSTS, COMPETITION, AND KIND OF GASOLINE MARKETED AT SPECIFIED POINTS—Continued.

[Cents per gallon.]

Various Standard Oil companies and marketing points.	Tank-wagon price.	Freight rate.	Tank-wagon price less freight rate.	Discount on large quantities.	Net tank-wagon price less freight rate.	Chief competitors.
Denver, Colo. (Continental Oil Co.):						
Jan. 1	13.00	2.44	10.56	.....	10.56	Great Western Oil Co.
Apr. 27	12.00	2.44	9.56	.....	9.56	The Texas Co.
June 21	11.00	2.44	8.56	.....	8.56	Cudahy Refining Co.
Aug. 30	12.00	2.44	9.56	.....	9.56	Mountain Motor Fuel Co.
Sept. 16	13.00	2.44	10.56	.....	10.56	Denver Powerine Co.
Oct. 6	14.00	2.44	11.56	.....	11.56	American Oil Processes
Oct. 28	15.00	2.44	12.56	.....	12.56	Co.
Nov. 16	16.00	2.44	13.56	.....	13.56	Berry-Talbot Oil Co.
Nov. 20	17.00	2.44	14.56	.....	14.56	
Dec. 2	18.00	2.44	15.56	.....	15.56	
Dec. 20	19.00	2.44	16.56	.....	16.56	
Indianapolis, Ind. (Standard of Indiana):						
Jan. 1	11.00	.69	10.31	1.00	9.31	Great Western Oil Co.
Feb. 22	10.50	.69	9.81	1.00	8.81	National Refining Co.
June 7	9.50	.69	8.81	1.00	7.81	Indian Refining Co.
Sept. 15	10.50	.69	9.81	1.00	8.81	
Sept. 29	11.50	.69	10.81	1.00	9.81	
Oct. 25	12.50	.69	11.81	1.00	10.81	
Nov. 15	13.50	.69	12.81	.....	12.81	
Nov. 22	14.50	.69	13.81	.....	13.81	
Dec. 13	15.50	.69	14.81	.....	14.81	
Dec. 30	16.50	.69	15.81	.....	15.81	
San Francisco, Cal. (Standard of California):						
Jan. 1	10.50	.20	10.30	.....	10.30	Union Oil Co. of Califor-
Feb. 2	9.50	.20	9.30	.....	9.30	nia.
July 7	9.00	.17	8.83	.....	8.83	Associated Oil Co.
Sept. 23	10.00	.17	9.83	.....	9.83	Shell Co. of California.
Oct. 5	11.00	.17	10.83	.....	10.83	
Oct. 25	12.00	.17	11.83	.....	11.83	
Nov. 27	13.00	.17	12.83	.....	12.83	

Refinery from which supplied.	Book cost of crude used.			Per cent of gasoline yielded.	Baumé gravity of gasoline.
	January.	July.	December.		
New York Harbor (New York City)	3.24	3.00	4.81	[1] 22.7	62.4–62.8
Cleveland, Ohio (Columbus, Ohio)	3.12	2.86	4.76	21.5	61 –67
Pittsburgh, Pa. (Pittsburgh, Pa.)	[2] 3.90	[2] 3.55	4.44	[2] 21.3	63 –65
Sugar Creek, Mo. (Omaha, Nebr.)	2.36	2.12	3.20	37.0	58 –60
Casper, Wyo. (Denver, Colo.)	1.16	1.15	1.81	19.0	59 –60.5
Whiting, Ind. (Indianapolis, Ind.)	2.69	2.42	3.91	37.0	58 –60
Richmond, Cal. (San Francisco, Cal.)	1.41	1.28	1.40	9.0	60

[1] Represents yield at Atlas Works, Buffalo, N. Y.

[2] Not reported separately for Pittsburgh refinery.

TABLE 2.—DATA UPON WHICH DIAGRAM 2, FACING PAGE 117, IS BASED, TOGETHER WITH INFORMATION CONCERNING COSTS, COMPETITION, AND KIND OF GASOLINE MARKETED AT SPECIFIED POINTS.

[Cents per gallon.]

Various Standard Oil companies and marketing points.	Tank-wagon price.	Freight rate.	Tank-wagon price less freight rate.	Discount on large quantities.	Net tank-wagon price less freight rate.	Chief competitors.
Boston, Mass. (Standard of New York):						
Jan. 1	14.00	0.36	13.64	.....	13.64	Gulf Refining Co.
Jan. 11	13.00	.36	12.64	.....	12.64	The Texas Co.
June 7	14.00	.36	13.64	.....	13.64	Hisgen Bros.
Aug. 16	15.00	.36	14.64	.....	14.64	National Oil Co.
Aug. 30	16.00	.36	15.64	.....	15.61	American Oil Co.
Sept. 7	17.00	.36	16.64	.....	16.64	The Alden Speare's Sons Co.
Oct. 8	18.00	.36	17.64	.....	17.64	
Nov. 3	19.00	.36	18.64	.....	18.64	
Nov. 22	20.00	.36	19.64	.....	19.64	
Dec. 9	21.00	.36	20.64	.....	20.64	
Dec. 20	22.00	.36	21.64	.....	21.64	
Newark, N. J. (Standard of New Jersey):						
Jan. 1	9.00	.06	8.94	.....	8.94	The Texas Co.
May 19	10.00	.06	9.94	.....	9.94	Gulf Refining Co.
June 14	11.00	.06	10.94	.....	10.94	Pure Oil Co.
July 15	12.00	.06	11.94	.....	11.94	Crew Levick Co.
Aug. 24	13.00	.06	12.94	.....	12.94	
Sept. 7	14.00	.06	13.94	.....	13.94	
Sept. 13	15.00	.06	14.94	.....	14.94	
Oct. 11	16.00	.06	15.94	.....	15.94	
Nov. 2	17.00	.06	16.94	.....	16.94	
Nov. 23	18.00	.06	17.94	.....	17.94	
Dec. 14	19.00	.06	18.94	.....	18.94	
Dec. 21	20.00	.06	19.94	.....	19.94	
New Albany, Ind. (Standard of Indiana):						
Jan. 1	11.00	.89	10.11	1.00	9.11	Kentucky Consumers Oil Co. of Indiana.
Feb. 22	10.50	.89	9.61	1.00	8.61	Chas. C. Stoll Oil Co.
June 7	9.50	.89	8.61	1.00	7.61	
Sept. 15	10.50	.89	9.61	1.00	8.61	
Sept. 29	11.50	.89	10.61	1.00	9.61	
Oct. 25	12.50	.89	11.61	1.00	10.61	
Nov. 15	13.50	.89	12.61	.....	12.61	
Nov. 22	14.50	.89	13.61	.....	13.61	
Dec. 13	15.50	.89	14.61	.....	14.61	
Dec. 30	16.50	.89	15.61	.....	15.61	

Refinery from which supplied.	Book cost of crude used.			Per cent of gasoline yielded.	Baumé gravity of gasoline.
	Jan.	July.	Dec.		
New York Harbor (Boston, Mass.)	3.24	3.00	4.81	[1] 22.74	62.4–62.8
Bayonne, N. J. (Newark, N. J.)	3.90	3.62	4.50	17.6	61 –62.6
Whiting, Ind. (New Albany, Ind.)	2.69	2.42	3.91	37	58 –60

[1] Represents yield at Atlas Works, Buffalo, N. Y.

TABLE 3.—DATA UPON WHICH DIAGRAM 3, FACING PAGE 118, IS BASED, TOGETHER WITH INFORMATION CONCERNING COSTS, COMPETITION, AND KIND OF GASOLINE MARKETED AT SPECIFIED POINTS.

[Cents per gallon.]

The Texas Co., various marketing points.	Tank-wagon price.	Freight rate.	Tank-wagon price less freight rate.	Discount on large quantities.	Net tank-wagon price less freight rate.	Chief competitors.
Norfolk, Va.:						
Jan. 1	13.00	1.45	11.55	.....	11.55	Standard of New Jersey.
Aug. 18	14.00	1.45	12.55	.....	12.55	National Oil Co.
Sept. 6	15.00	1.45	13.55	.....	13.55	
Sept. 10	16.00	1.45	14.55	.....	14.55	
Oct. 5	17.00	1.45	15.55	.....	15.55	
Nov. 4	18.00	1.45	16.55	.....	16.55	
Dec. 9	19.00	1.45	17.55	.....	17.55	
Dec. 16	20.50	1.45	19.05	.....	19.05	
Dec. 22	21.50	1.45	20.05	.....	20.05	
Albany, N. Y.:						
Jan. 1	12.00	1.59	10.41	.....	10.41	Standard of New York.
Jan. 8	11.00	1.59	9.41	.....	9.41	Hisgen Bros.
June 22	12.00	1.59	10.41	.....	10.41	
July 28	13.00	1.59	11.41	.....	11.41	
Aug. 17	14.00	1.59	12.41	.....	12.41	
Aug. 31	15.00	1.59	13.41	.....	13.41	
Sept. 7	16.00	1.59	14.41	.....	14.41	
Oct. 9	17.00	1.59	15.41	.....	15.41	
Nov. 4	18.00	1.59	16.41	.....	16.41	
Nov. 23	19.00	1.59	17.41	.....	17.41	
Dec. 9	20.00	1.59	18.41	.....	18.41	
Dec. 16	21.00	1.59	19.41	.....	19.41	
Denver, Colo.:						
Jan. 1	15.00	2.44	12.56	.....	[1] 10.56	Great Western Oil Co.
Oct. 7	16.00	2.44	13.56	.....	[1] 9.56	Cudahy Refining Co.
Nov. 13	16.50	2.44	14.06	.....	[1] 8.56	Mountain Motor Fuel Co.
Nov. 17	17.00	2.44	14.56	.....	[1] 9.56	Denver Powerine Co.
					[1] 10.56	American Oil Processes
Nov. 20	17.50	2.44	15.06	.....	[1] 11.56	Co.
					[1] 12.56	Continental Oil Co.
Nov. 23	18.00	2.44	15.56	.....	[1] 13.56	Berry-Talbot Oil Co.
					[1] 14.56	
Nov. 30	19.00	2.44	16.56	.....	[1] 15.56	
Dec. 21	20.00	2.44	17.56	.....	[1] 16.56	
Austin, Tex.:						
Jan. 1	11.00	1.60	9.40	.....	9.40	Pierce-Fordyce Oil Asso-
Jan. 8	10.00	1.60	8.40	.....	8.40	ciation.
Apr. 15	12.00	1.60	10.40	1.00	9.40	Gulf Refining Co.
June 14	13.00	1.60	11.40	2.00	9.40	Magnolia Petroleum Co.
Aug. 18	14.00	1.60	12.40	2.00	10.40	Eggleston Oil Co.
Sept. 16	15.00	1.60	13.40	2.00	11.40	
Oct. 6	17.00	1.60	15.40	2.00	13.40	
Nov. 20	19.00	1.60	17.40	2.00	15.40	

[1] Based on tank-wagon tickets issued by The Texas Co. in Denver on the following dates: Apr. 19, 29; June 21; Sept. 9, 20; Oct. 11, 29; Nov. 22, 29; Dec. 9, 22.

TABLE 3.—DATA UPON WHICH DIAGRAM 3, FACING PAGE 118, IS BASED, TOGETHER WITH INFORMATION CONCERNING COSTS, COMPETITION, AND KIND OF GASOLINE MARKETED AT SPECIFIED POINTS—Continued.

[Cents per gallon.]

The Texas Co., various marketing points.	Tank-wagon price.	Freight rate.	Tank-wagon price less freight rate.	Discount on large quantities.	Net tank-wagon price less freight rate.	Chief competitors.
Youngstown, Ohio:						
Jan. 1	11.00	1.03	9.97	.....	9.97	Standard of Ohio.
June 24	10.00	1.03	8.97	.....	8.97	Freedom Oil Works Co.
Aug. 25	10.50	1.03	9.47	.....	9.47	Vahey Oil Co.
Sept. 10	11.00	1.03	9.97	.....	9.97	
Sept. 16	12.00	1.03	10.97	.....	10.97	
Oct. 1	12.50	1.03	11.47	.....	11.47	
Oct. 23	14.00	1.03	12.97	.....	12.97	
Nov. 17	15.00	1.03	13.97	.....	13.97	
Nov. 23	16.00	1.03	14.97	.....	14.97	
Dec. 9	17.00	1.03	15.97	.....	15.97	
Dec. 16	18.00	1.03	16.97	.....	16.97	
Chicago, Ill.:						
Jan. 1	11.00	.19	10.81	.....	10.81	Standard of Indiana.
Feb. 22	10.50	.19	10.31	.....	10.31	Indian Refining Co.
June 1	9.50	.19	9.31	.....	9.31	Riverside Oil Co.
Sept. 15	10.50	.19	10.31	.....	10.31	Reliable Oil Co.
Sept. 24	11.50	.19	11.31	.....	11.31	Cosden & Co.
Oct. 20	12.50	.19	12.31	.....	12.31	Consumers Mutual Oil Co.
Nov. 16	13.50	.19	13.31	.....	13.31	
Nov. 23	14.50	.19	14.31	.....	14.31	The Sun Oil Co. Paragon Refining Co.
Dec. 9	15.50	.19	15.31	.....	15.31	Keystone Oil & Manufacturing Co.
Dec. 23	16.50	.19	16.31	.....	16.31	Missouri Valley Oil Co. National Refining Co. Red Seal Oil Co.

Refinery from which supplied.	Book cost of crude used.			Per cent of gasoline yielded.	Baumé gravity of gasoline.
	January.	July.	December.		
Port Arthur, Tex. (Norfolk, Va.; Albany, N. Y.)	2.27	1.95	2.65	13.4	60–65
West Dallas, Tex. (Austin, Tex.)	2.27	1.95	2.65	13.4	60–65
Lockport, Ill. (Youngstown, Ohio; Chicago, Ill.)	2.27	1.95	2.65	13.4	60–65
Casper, Wyo. (Denver, Colo.)	[1] 1.16	[1] 1.15	[1] 1.81	[1] 19.0	59–60.5

[1] Gasoline purchased, presumably from Midwest Refining Co.

TABLE 4.—DATA UPON WHICH DIAGRAM 4, FACING PAGE 119, IS BASED, TOGETHER WITH INFORMATION CONCERNING COSTS, COMPETITION, AND KIND OF GASOLINE MARKETED AT SPECIFIED POINTS.

[Cents per gallon.]

Gulf Refining Co.	Tank-wagon price.	Freight rate.	Tank-wagon price less freight rate.	Discount on large quantities.	Net tank-wagon price less freight rate.	Chief competitors.
Jacksonville, Fla.:						
Jan. 1	13.00	0.60	12.40	.....	12.40	Standard of Kentucky.
Apr. 15	12.00	.60	11.40	.....	11.40	The Texas Co.
Aug. 2	14.00	.60	13.40	.....	13.40	
Sept. 2	16.00	.60	15.40	.....	15.40	
Nov. 30	17.50	.60	16.90	.....	16.90	
Dec. 21	18.50	.60	17.90	.....	17.90	
Atlanta, Ga.:						
Jan. 1	10.50	2.91	7.59	.....	7.59	Standard of Kentucky.
Sept. 2	13.00	2.91	10.09	.....	10.09	The Texas Co.
Oct. 19	17.00	2.91	14.09	.....	14.09	
Dec. 2	19.00	2.91	16.09	.....	16.09	
Dec. 21	20.00	2.91	17.09	.....	17.09	
Houston, Tex.:						
Jan. 1	8.00	1.60	6.40	.....	6.40	Magnolia Petroleum Co.
Apr. 19	10.00	1.60	8.40	.....	8.40	The Texas Co.
June 16	11.00	1.60	9.40	.....	9.40	Pierce-Fordyce Oil Association.
Aug. 14	12.00	1.60	10.40	.....	10.40	
Sept. 17	13.00	1.60	11.40	.....	11.40	
Oct. 8	15.00	1.60	13.40	.....	13.40	
Nov. 18	17.00	1.60	15.40	.....	15.40	

Refinery from which supplied.	Book cost of crude used.			Per cent of gasoline yielded.	Baumé gravity of gasoline.
	January.	July.	December.		
Port Arthur, Tex. (Jacksonville, Fla.; Atlanta, Ga.)	2.42	1.97	2.97	11.4	62–65
Fort Worth, Tex. (Houston, Tex.)	2.42	1.97	2.97	.....	62–65

TABLE 5.—DATA UPON WHICH DIAGRAM 13, FACING PAGE 116, IS BASED, TOGETHER WITH INFORMATION CONCERNING COSTS, COMPETITION, AND KIND OF GASOLINE MARKETED.

[Cents per gallon.]

Various Standard Oil companies and marketing points.	Tank-wagon price.	Freight rate.	Tank-wagon price less freight rate.	Discount on large quantities.	Net tank-wagon price less freight rate.	Chief competitors.*
Van Wert, Ohio (Standard of Ohio):						
Jan. 1	12.00	0.90	11.10	.....	11.10	
Jan. 20	11.00	.90	10.10	.....	10.10	
June 16	10.00	.90	9.10	.....	9.10	
Aug. 23	10.50	.90	9.60	.....	9.60	
Sept. 9	11.00	.90	10.10	.....	10.10	
Sept. 15	12.00	.90	11.10	.....	11.10	
Sept. 30	12.50	.90	11.60	.....	11.60	
Oct. 23	14.00	.90	13.10	.....	13.10	
Nov. 16	15.00	.90	14.10	.....	14.10	
Nov. 20	16.00	.90	15.10	.....	15.10	
Dec. 8	17.00	.90	16.10	.....	16.10	
Dec. 21	18.00	.90	17.10	.....	17.10	
Decatur, Ind. (Standard of Indiana):						
Jan. 1	11.00	.65	10.35	1.00	9.35	
Feb. 22	10.50	.65	9.85	1.00	8.85	
June 7	9.50	.65	8.85	1.00	7.85	
Sept. 15	10.50	.65	9.85	1.00	8.85	
Sept. 29	11.50	.65	10.85	1.00	9.85	
Oct. 25	12.50	.65	11.85	1.00	10.85	
Nov. 15	13.50	.65	12.85	.....	12.85	
Nov. 22	14.50	.65	13.85	.....	13.85	
Dec. 13	15.50	.65	14.85	.....	14.85	
Dec. 30	16.50	.65	15.85	.....	15.85	

Refinery from which supplied.	Book cost of crude used.			Per cent of gasoline yielded.	Baumé gravity of gasoline.
	January.	July.	December.		
					°
Parkersburg, W. Va. (Van Wert, Ohio)	[1] 3.90	[1] 3.62	[1] 4.50	[1] 17.6	[2] 58–62
Whiting, Ind. (Decatur, Ind.)	2.69	2.42	3.91	37.0	58–60

*Competitors not reported.

[1] Average for all refineries operated by Standard of New Jersey.

[2] Average for all gasoline purchased by Standard of Ohio.

TABLE 6.—DATA UPON WHICH DIAGRAM 14, FACING PAGE 116, IS BASED, TOGETHER WITH INFORMATION CONCERNING COSTS, COMPETITION, AND KIND OF GASOLINE MARKETED.

[Cents per gallon.]

Various Standard Oil companies and marketing points.	Tank-wagon price.	Freight rate.	Tank-wagon price less freight rate.	Discount on large quantities.	Net tank-wagon price less freight rate.	Chief competitors.
Omaha, Nebr. (Standard of Nebraska):						
Jan. 1	11.50	0.86	10.64	.....	10.64	National Refining Co.
Feb. 1	11.00	.86	10.14	.....	10.14	Manhattan Oil Co.
Feb. 15	10.75	.86	9.89	.....	9.89	Missouri Valley Oil Co.
Mar. 17	10.25	.86	9.39	.....	9.39	Cudahy Refining Co.
Mar. 27	10.00	.86	9.14	.....	9.14	L. V. Nicholas Oil Co.
Sept. 16	11.00	.86	10.14	.....	10.14	
Sept. 29	11.50	.86	10.64	.....	10.64	
Oct. 25	12.50	.86	11.64	.....	11.64	
Nov. 3	13.00	.86	12.14	.....	12.14	
Nov. 16	14.00	.86	13.14	.....	13.14	
Nov. 20	15.00	.86	14.14	.....	14.14	
Dec. 14	16.00	.86	15.14	.....	15.14	
Dec. 20	16.50	.86	15.64	.....	15.64	
Dec. 28	17.50	.86	16.64	.....	16.64	
Council Bluffs, Iowa (Standard of Indiana):						
Jan. 1	10.90	.86	10.04	1.00	9.04	National Refining Co.
Feb. 22	10.40	.86	9.54	1.00	8.54	Pennsylvania Consumers
June 10	9.40	.86	8.54	1.00	7.54	Oil Co.
Sept. 15	10.40	.86	9.54	1.00	8.54	
Sept. 29	11.40	.86	10.54	1.00	9.54	
Oct. 25	12.40	.86	11.54	1.00	10.54	
Nov. 15	13.40	.86	12.54	.....	12.54	
Nov. 22	14.40	.86	13.54	.....	13.54	
Dec. 13	15.40	.86	14.54	.....	14.54	
Dec. 30	16.40	.86	15.54	.....	15.54	

Refinery from which supplied.	Book cost of crude used.			Per cent of gasoline yielded.	Baumé gravity of gasoline.
	January.	July.	December.		
Sugar Creek, Mo. (Omaha, Nebr.; Council Bluffs, Iowa)	2.36	2.12	3.20	37.0	58–60

TABLE 7.—DATA UPON WHICH DIAGRAM 15, FACING PAGE 116, IS BASED, TOGETHER WITH INFORMATION CONCERNING COSTS, COMPETITION, AND KIND OF GASOLINE MARKETED.

[Cents per gallon.]

Various Standard Oil companies and marketing points.	Tank-wagon price.	Freight rate.	Tank-wagon price less freight rate.	Discount on large quantities.	Net tank-wagon price less freight rate.	Chief competitors.
Nashville, Tenn. (Indian Refining Co.):						
Jan. 1	12.50	1.50	11.00	1.50	9.50	Standard of Louisiana.
May 24	13.00	1.50	11.50	1.50	10.00	
Aug. 12	14.00	1.50	12.50	1.50	11.00	Gulf Refining Co. of
Aug. 24	15.00	1.50	13.50	2.00	11.50	Louisiana.
Sept. 11	16.00	1.50	14.50	2.00	12.50	Tennessee Auto Co.
Sept. 24	17.00	1.50	15.50	2.00	13.50	
Nov. 23	17.50	1.50	16.00	2.00	14.00	
Dec. 10	18.50	1.50	17.00	2.00	15.00	
Waterloo, Iowa (Standard of Indiana):						
Jan. 1	11.00	1.45	9.55	1.00	8.55	Bartles-Sweney Oil Co.
Feb. 22	10.50	1.45	9.05	1.00	8.05	Hawkeye Oil Co.
June 10	9.50	1.45	8.05	1.00	7.05	Canfield Oil Co.
Sept. 15	10.50	1.45	9.05	1.00	8.05	Waterloo Chemical Co.
Sept. 29	11.60	1.12	10.48	1.00	9.48	
Oct. 25	12.60	1.12	11.48	1.00	10.48	
Nov. 15	13.60	1.12	12.48	.....	12.48	
Nov. 22	14.60	1.12	13.48	.....	13.48	
Dec. 13	15.60	1.12	14.48	.....	14.48	
Dec. 30	16.60	1.12	15.48	.....	15.48	

Refinery from which supplied.	Book cost of crude used.			Per cent of gasoline yielded.	Baumé gravity of gasoline.
	January.	July.	December.		
Lawrenceville, Ill. (Nashville, Tenn.)	2.39	2.28	3.74	20.3	59–60
Neodesha, Kans	1.83	1.80	3.40	33.1	58–60
Sugar Creek, Mo. (Waterloo, Iowa)	2.36	2.12	3.20	37.0	58–60

TABLE 8.—DATA UPON WHICH DIAGRAM 16, FACING PAGE 117, IS BASED, TOGETHER WITH INFORMATION CONCERNING COSTS, COMPETITION, AND KIND OF GASOLINE MARKETED.

[Cents per gallon.]

Various Standard Oil companies and marketing points.	Tank-wagon price.	Freight rate.	Tank-wagon price less freight rate.	Discount on large quantities.	Net tank-wagon price less freight rate.	Chief competitors.
Louisville, Ky. (Standard of Kentucky):						
Jan. 1	11.50	0.94	10.56	2.00	8.56	Gulf Refining Co.
Mar. 1	11.00	.94	10.06	2.00	8.06	Kentucky Consumers Oil
Apr. 20	10.00	.94	9.06	2.00	7.06	Co. of Indiana.
June 7	10.50	.94	9.56	2.00	7.56	Chas. C. Stoll Oil Co.
Aug. 30	11.50	.94	10.56	2.00	8.56	Indian Refining Co.
Sept. 23	12.50	.94	11.56	1.00	10.56	
Oct. 5	13.50	.94	12.56	1.00	11.56	
Nov. 8	14.50	.94	13.56	1.00	12.56	
Nov. 25	17.00	.94	16.06	1.00	15.06	
Dec. 13	18.00	.94	17.06	1.00	16.06	
Dec. 29	19.00	.94	18.06	1.00	17.06	
New Albany, Ind. (Standard of Indiana):						
Jan. 1	11.00	.89	10.11	1.00	9.11	Kentucky Consumers Oil
Feb. 22	10.50	.89	9.61	1.00	8.61	Co. of Indiana.
June 7	9.50	.89	8.61	1.00	7.61	Chas. C. Stoll Oil Co.
Sept. 15	10.50	.89	9.61	1.00	8.61	
Sept. 29	11.50	.89	10.61	1.00	9.61	
Oct. 25	12.50	.89	11.61	1.00	10.61	
Nov. 15	13.50	.89	12.61	.....	12.61	
Nov. 22	14.50	.89	13.61	.....	13.61	
Dec. 13	15.50	.89	14.61	.....	14.61	
Dec. 30	16.50	.89	15.61	.....	15.61	

Refinery from which supplied.	Book cost of crude used.			Per cent of gasoline yielded.	Baumé gravity of gasoline.
	January.	July.	December.		
					°
Wood River, Ill. (Louisville, Ky.)	[1] 2.57	[1] 2.34	[1] 3.76	[1] 37.0	58–60
Whiting, Ind. (New Albany, Ind.)	2.69	2.42	3.91	37.0	58–60

[1] Average for the Wood River, Ill., Sugar Creek, Mo., and Whiting, Ind., plants of the Standard of Indiana.

TABLE 9.—DATA UPON WHICH DIAGRAM 17, FACING PAGE 117, IS BASED, TOGETHER WITH INFORMATION CONCERNING COSTS, COMPETITION, AND KIND OF GASOLINE MARKETED.

[Cents per gallon.]

Various Standard Oil companies and marketing points.	Tank-wagon price.	Freight rate.	Tank-wagon price less freight rate.	Discount on large quantities.	Net tank-wagon price less freight rate.	Chief competitors.
Abilene, Tex. (Magnolia Petroleum Co.):						
Jan. 1	9.00	1.65	7.35	.....	7.35	Pierce-Fordyce Oil Association.
Jan. 9	8.00	1.65	6.35	.....	6.35	
Apr. 17	10.00	1.65	8.35	.....	8.35	The Texas Co.
June 10	11.00	1.65	9.35	.....	9.35	Gulf Refining Co.
Aug. 7	12.00	1.65	10.35	.....	10.35	
Sept. 6	13.00	1.65	11.35	.....	11.35	
Oct. 5	15.00	1.65	13.35	.....	13.35	
Nov. 5	17.00	1.65	15.35	.....	15.35	
Hutchinson, Kans. (Standard of Indiana):						
Jan. 1	10.80	.59	10.21	1.00	9.21	American Oil Co.
Feb. 22	10.30	.59	9.71	1.00	8.71	Hutchinson Oil Co.
June 10	9.30	.59	8.71	1.00	7.71	Uncle Sam Oil Co. of Kansas.
Sept. 15	10.30	.59	9.71	1.00	8.71	
Sept. 29	11.30	.59	10.71	1.00	9.71	
Oct. 25	12.30	.59	11.71	1.00	10.71	
Nov. 15	13.30	.59	12.71	.....	12.71	
Nov. 22	14.30	.59	13.71	.....	13.71	
Dec. 13	15.30	.59	14.71	.....	14.71	
Dec. 30	16.30	.59	15.71	.....	15.71	

Refinery from which supplied.	Book cost of crude used.			Per cent of gasoline yielded.	Baumé gravity of gasoline.
	January.	July.	December.		
Corsicana, Tex. (Abilene, Tex.)	[1] 2.29	[1] 1.55	[1] 2.24	[1] 19.0	[1] 58.5–64.5
Neodesha, Kans. (Hutchinson, Kans.)	1.83	1.80	3.40	33.1	58–60

[1] Average for all refineries operated by the Magnolia Petroleum Co.

TABLE 10.—DATA UPON WHICH DIAGRAM 18, FACING PAGE 118, IS BASED, TOGETHER WITH INFORMATION CONCERNING COSTS, COMPETITION, AND KIND OF GASOLINE MARKETED.

[Cents per gallon.]

Various Standard Oil companies and marketing points.	Tank-wagon price.	Freight rate.	Tank-wagon price less freight rate.	Discount on large quantities.	Net tank-wagon price less freight rate.	Chief competitors.
Lewiston, Idaho (Continental Oil Co.):						
Jan. 1	17.50	5.28	12.22	.....	12.22	Pure Oil Co.
Feb. 15	17.00	5.28	11.72	.....	11.72	Shell Co. of California.
May 8	16.00	5.28	10.72	.....	10.72	
Aug. 30	17.00	5.28	11.72	.....	11.72	
Sept. 22	16.00	5.28	10.72	.....	10.72	
Oct. 1	17.00	5.28	11.72	.....	11.72	
Oct. 5	18.00	5.28	12.72	.....	12.72	
Oct. 25	19.00	5.28	13.72	.....	13.72	
Nov. 3	20.00	5.28	14.72	.....	14.72	
Dec. 7	21.00	5.28	15.72	.....	15.72	
Coeur d'Alene, Idaho (Continental Oil Co.):						
Jan. 1	15.00	5.28	9.72	.....	9.72	Pure Oil Co.
Aug. 30	16.00	5.28	10.72	.....	10.72	Shell Co. of California.
Sept. 22	15.00	5.28	9.72	.....	9.72	
Oct. 1	16.00	5.28	10.72	.....	10.72	
Oct. 5	17.00	5.28	11.72	.....	11.72	
Oct. 25	18.00	5.28	12.72	.....	12.72	
Nov. 3	18.50	5.28	13.22	.....	13.22	
Nov. 15	18.00	5.28	12.72	.....	12.72	
Dec. 7	18.75	5.28	13.47	.....	13.47	
Spokane, Wash. (Standard of California):						
Jan. 1	12.50	3.84	8.66	.....	8.66	Pure Oil Co.
Feb. 2	11.50	3.84	7.66	.....	7.66	Shell Co. of California.
Feb. 20	12.50	3.84	8.66	.....	8.66	
Sept. 23	13.50	3.84	9.66	.....	9.66	
Oct. 5	14.50	3.84	10.66	.....	10.66	
Oct. 26	15.50	3.84	11.66	.....	11.66	
Nov. 27	16.50	3.84	12.66	.....	12.66	

Refinery from which supplied.	Book cost of crude used.			Per cent of gasoline yielded.	Baumé gravity of gasoline.
	January.	July.	December.		
Casper, Wyo. (Lewiston, Idaho, Coeur d'Alene, Idaho)	[1] 1.16	[1] 1.15	[1] 1.81	[1] 19.0	° 59–60.5
Richmond, Cal. (Spokane, Wash)	1.41	1.28	1.40	9.0	60

[1] For the Midwest Refining Co. plant at Casper, Wyo.

TABLE 11.—DATA UPON WHICH DIAGRAM 22, FACING PAGE 127, IS BASED, TOGETHER WITH INFORMATION CONCERNING COSTS, COMPETITION, AND KIND OF GASOLINE MARKETED.

[Cents per gallon.]

Kansas City, Mo.	Tank-wagon price.	Freight rate.	Tank-wagon price less freight rate.	Discount on large quantities.	Net tank-wagon price less freight rate.	Chief competitors.
Mutual Oil Co.:						
Jan. 1	10.30	0.66	9.64	.....	9.64	Marshall Oil Co.
Feb. 23	9.80	.66	9.14	.....	9.14	Uncle Sam Oil Co. of Kansas.
June 10	8.80	.99	7.81	.....	7.81	
Sept. 1	9.80	.99	8.81	.....	8.81	Kansas Cooperative Refining Co.
Sept. 22	10.80	.10	10.70	.....	10.70	
Oct. 21	11.80	1.12	10.68	.....	10.68	National Refining Co.
Nov. 2	12.80	.99	11.81	.....	11.81	
Nov. 17	13.80	.10	13.70	.....	13.70	
Dec. 1	14.80	.10	14.70	.....	14.70	
Dec. 30	15.80	.10	15.70	.....	15.70	
Standard of Indiana:						
Jan. 1	10.30	.10	10.20	1.00	9.20	Marshall Oil Co.
Feb. 22	9.80	.10	9.70	1.00	8.70	Uncle Sam Oil Co. of Kansas.
June 10	8.80	.10	8.70	1.00	7.70	
Sept. 15	9.80	.10	9.70	1.00	8.70	Kansas Cooperative Refining Co.
Sept. 29	10.80	.10	10.70	1.00	9.70	
Oct. 25	11.80	.10	11.70	1.00	10.70	National Refining Co.
Nov. 15	12.80	.10	12.70	.....	12.70	
Nov. 22	13.80	.10	13.70	.....	13.70	
Dec. 13	14.80	.10	14.70	.....	14.70	
Dec. 30	15.80	.10	15.70	.....	15.70	

Refinery from which supplied.	Book cost of crude used.			Per cent of gasoline yielded.	Baumé gravity of gasoline.
	January.	July.	December.		
Various Kansas and Oklahoma points (Mutual Oil, jobbing company)	.....	.....	.....	.....	59–61
Sugar Creek, Mo. (Standard of Indiana)	2.36	2.12	3.20	37	58–60

TABLE 12.—DATA UPON WHICH DIAGRAM 23, FACING PAGE 127, IS BASED, TOGETHER WITH INFORMATION CONCERNING COSTS, COMPETITION, AND KIND OF GASOLINE MARKETED.

[Cents per gallon.]

Waterloo, Iowa.	Tank-wagon price.	Freight rate.	Tank-wagon price less freight rate.	Discount on large quantities.	Net tank-wagon price less freight rate.	Chief competitors.
Standard of Indiana:						
Jan. 1	11.00	1.45	9.55	1.00	8.55	Hawkeye Oil Co.
Feb. 22	10.50	1.45	9.05	1.00	8.05	Canfield Oil Co.
June 10	9.50	1.45	8.05	1.00	7.05	Waterloo Chemical Co.
Sept. 15	10.50	1.45	9.05	1.00	8.05	
Sept. 29	11.60	1.12	10.48	1.00	9.48	
Oct. 25	12.60	1.12	11.48	1.00	10.48	
Nov. 15	13.60	1.12	12.48	.....	12.48	
Nov. 22	14.60	1.12	13.48	.....	13.48	
Dec. 13	15.60	1.12	14.48	.....	14.48	
Dec. 30	16.60	1.12	15.48	.....	15.48	
Bartles-Sweney Oil Co.:						
Jan. 1	11.00	1.62	9.38	.....	9.38	Hawkeye Oil Co.
Feb. 23	10.50	1.62	8.88	.....	8.88	Canfield Oil Co.
June 12	9.50	1.62	7.88	1.00	6.88	Waterloo Chemical Co.
Aug. 28	10.50	1.62	8.88	1.00	7.88	
Sept. 15	11.00	1.62	9.38	1.00	8.38	
Sept. 29	12.00	1.62	10.38	1.00	9.38	
Oct. 25	13.00	1.62	11.38	1.00	10.38	
Nov. 16	14.00	1.62	12.38	1.00	11.38	
Nov. 22	15.00	1.62	13.38	.....	13.38	
Dec. 13	16.00	1.62	14.38	.....	14.38	
Dec. 30	17.00	1.62	15.38	.....	15.38	

Refinery from which supplied.	Book cost of crude used.			Per cent of gasoline yielded.	Baumé gravity of gasoline.
	January.	July.	December.		
Sugar Creek, Mo.	2.36	2.12	3.20	37.0	58-60
Neodesha, Kans. (Standard of Indiana)	1.83	1.80	3.40	33.1	58-60
Various Kansas and Oklahoma points (Bartles-Sweney Oil Co., jobbing company)	.....	.....	.....	.....	58-60

PART 3.

GENERAL STATISTICAL EXHIBITS.

TABLE 13.—PRODUCTION (BARRELS) OF CRUDE OIL IN VARIOUS FIELDS OF THE UNITED STATES, BY MONTHS, 1914 AND 1915.

Month.	Appalachian.		Lima-Indiana.		Illinois.	
	1914[1]	1915[1]	1914[1]	1915[1]	1914[1]	1915[1]
January	2,104,000	1,899,000	451,000	354,000	1,935,000	1,614,000
February	1,774,000	1,834,000	326,000	360,000	1,571,000	1,542,000
March	2,245,000	2,039,000	464,000	388,000	1,970,000	1,761,000
April	2,271,000	2,003,000	465,000	396,000	1,833,000	1,643,000
May	2,132,000	1,883,000	458,000	359,000	1,971,000	1,639,000
June	2,153,000	1,964,000	461,000	374,000	1,932,000	1,604,000
July	2,212,000	1,945,000	459,000	364,000	1,908,000	1,637,000
August	1,216,000	1,884,000	429,000	342,000	1,845,000	1,593,000
September	1,761,000	1,868,000	423,000	339,000	1,817,000	1,535,000
October	2,330,000	1,831,000	420,000	345,000	1,813,000	1,534,000
November	1,895,000	1,788,000	364,000	320,000	1,679,000	1,452,000
December	2,008,000	1,923,000	342,000	328,000	1,645,000	1,487,000
Total	24,101,000	22,961,000	5,062,000	4,269,000	21,919,000	19,041,000

Month.	Kansas-Oklahoma.							
	Cushing.		Healdton.		Other Kansas-Oklahoma.		Total Kansas-Oklahoma.	
	1914	1915	1914	1915	1914	1915	1914	1915
January	597,000	7,394,000	.....	195,000	5,476,000	3,587,000	6,073,000	11,176,000
February	1,065,000	5,712,000	.....	30,000	4,723,000	3,371,000	5,788,000	9,113,000
March	2,201,000	6,917,000	499,000	52,000	4,863,000	3,614,000	7,563,000	10,583,000
April	2,235,000	8,658,000	495,000	135,000	4,806,000	3,381,000	7,536,000	12,174,000
May	4,387,000	7,471,000	760,000	140,000	4,172,000	3,715,000	9,319,000	11,326,000
June	4,380,000	8,003,000	900,000	220,000	4,526,000	3,376,000	9,806,000	11,599,000
July	4,836,000	6,324,000	1,085,000	370,000	4,754,000	3,731,000	10,675,000	10,425,000
August	4,687,000	5,619,000	1,296,000	347,000	4,617,000	3,725,000	10,600,000	9,691,000
September	5,145,000	4,260,000	810,000	600,000	2,673,000	3,779,000	8,628,000	8,639,000
October	5,275,000	3,821,000	620,000	798,000	3,783,000	4,044,000	9,678,000	8,663,000
November	5,649,000	3,390,000	556,000	1,200,000	3,407,000	4,077,000	9,612,000	8,667,000
December	6,766,000	3,137,000	589,000	2,325,000	3,367,000	4,402,000	10,722,000	9,864,000
Total	47,223,000	70,706,000	7,610,000	6,412,000	51,167,000	44,802,000	106,000,000	121,920,000

[1] These figures are compiled from the latest Geological Survey estimates and represent marketed production, i. e., the quantity disposed of by the producer during the year either by sale or consumption. The remaining figures are based upon figures published in the Fuel Oil Journal, the Oil and Gas Journal, and the Oil, Paint, and Drug Reporter.

TABLE 13.—PRODUCTION (BARRELS) OF CRUDE OIL IN VARIOUS FIELDS OF THE UNITED STATES, BY MONTHS, 1914 AND 1915—Continued.

Month.	North Texas.		Northwest Louisiana.		Wyoming.[1]	
	1914	1915	1914	1915	1914[2]	1915[2]
January	952,000	627,000	1,021,000	779,000	217,000	365,000
February	858,000	565,000	851,000	878,000	179,000	282,000
March	960,000	614,000	1,332.000	1,042,000	247,000	380,000
April	860,000	658,000	1,091,000	1,133,000	318,000	226,000
May	851,000	755,000	1,131,000	1,239,000	394,000	262,000
June	812,000	679,000	1,411,000	1,199,000	239,000	387,000
July	849,000	642,000	1,287,000	1,450,000	307,000	383,000
August	776,000	612,000	1,162,000	1,630,000	399,000	459,000
September	731,000	607,000	1,129,000	1,539,000	406,000	395,000
October	716,000	591,000	962,000	1,282,000	394,000	477,000
November	700,000	581,000	878,000	1,210,000	363,000	413,000
December	705,000	605,000	855,000	1,185,000	320,000	441,000
Total	9,770,000	7,536,000	13,110,000	[3]15,552,000	3,783,000	4,470,000

Month.	Gulf Coast.		California.		Grand total.	
	1914	1915[1]	1914	1915	1914	1915
January	840,000	1,190,000	8,656,000	7,698,000	22,249,000	25,702,000
February	738,000	1,423,000	7,954,000	6,949,000	20,039,000	22,946,000
March	1,080,000	1,469,000	8,839,000	7,567,000	24,700,000	25,843,000
April	1,309,000	1,431,000	8,562,000	7,337,000	24,245,000	27,001,000
May	1,372,000	1,248,000	9,046,000	7,687,000	26,674,000	26,398,000
June	1,331,000	1,329,000	9,336,000	7,444,000	27,481,000	26,579,000
July	1,237,000	1,559,000	9,859,000	7,739,000	28,793,000	26,144,000
August	1,202,000	1,486,000	9,035,000	7,680,000	26,664,000	25,377,000
September	1,195,000	1,878,000	8,504,000	7,330,000	24,594,000	24,130,000
October	1,267,000	2,437,000	8,361,000	7,675,000	25,941,000	24,835,000
November	1,119,000	2,824,000	7,905,000	7,223,000	24,515,000	24,478,000
December	1,209,000	2,303,000	7,826,000	7,397,000	25,632,000	25,533,000
Total	13,899,000	20,577,000	103,883,000	89,726,000	301,527,000	[3]305,952,000

[1] Includes Colorado.

[2] These figures are compiled from the latest Geological Survey estimates and represent marketed production, i. e., the quantity disposed of by the producer during the year either by sale or consumption. The remaining figures are based upon figures published in the Fuel Oil Journal, the Oil and Gas Journal, and the Oil, Paint, and Drug Reporter.

[3] These totals include 986,000 barrels, estimated quantity run by three independent refineries at Shreveport, La. The quantity run has not been segregated by months.

TABLE 14.—RELATION OF THE PRODUCTION OF THE CUSHING POOL TO THE COMBINED PRODUCTION OF LIGHT CRUDES (CALIFORNIA AND GULF COAST CRUDES OMITTED), BY MONTHS, 1915.

Month.	Monthly production.			Month.	Monthly production.		
	Mid-Continent and eastern fields.	Cushing pool.			Mid-Continent and eastern fields.	Cushing pool.	
		Quantity.	Per cent.			Quantity.	Per cent.
	Barrels.	*Barrels.*			*Barrels.*	*Barrels.*	
January	16,814,000	7,394,000	44.0	August	16,211,000	5,619,000	34.7
February	14,574,000	5,712,000	39.2	September	14,922,000	4,260,000	28.5
March	16,807,000	6,917,000	41.2	October	14,723,000	3,821,000	26.0
April	18,233,000	8,658,000	47.5	November	14,431,000	3,390,000	23.5
May	17,463,000	7,471,000	42.8	December	15,833,000	3,137,000	19.8
June	17,806,000	8,003,000	44.9				
July	16,846,000	6,324,000	37.5	Total	195,649,000	70,706,000	36.1

TABLE 15.—STOCKS (BARRELS) OF CRUDE OIL OF SPECIFIED FIELDS IN STORAGE AND IN PIPE LINES,[2] AS REPORTED TO THE FEDERAL TRADE COMMISSION, AT THE END OF EACH MONTH, JANUARY, 1915, TO MARCH, 1916, INCLUSIVE.[3]

Year and month.	Appalachian and Lima-Indiana fields.	Mid-Continent field.					
		Kansas-Oklahoma.			North Texas.	Northwestern Louisiana.	Total.
		Held by pipe lines and allied companies.	Held by producers.	Total.			
1915.							
January	10,265,396	53,980,742	20,000,000	73,980,742	550,800	802,818	75,334,360
February	10,534,453	54,160,449	21,000,000	75,160,449	650,447	779,672	76,590,568
March	10,594,721	53,571,169	20,000,000	73,571,169	672,500	777,730	75,021,399
April	10,940,140	54,050,790	25,000,000	79,050,790	706,877	893,272	80,650,939
May	10,600,585	54,162,270	28,000,000	82,162,270	756,678	1,123,661	84,042,609
June	10,731,910	53,623,770	30,000,000	83,623,770	770,240	1,287,827	85,681,837
July	11,768,936	56,614,770	42,000,000	98,614,770	689,068	1,668,153	100,971,991
August	11,810,955	66,521,770	29,000,000	95,521,770	638,406	1,860,991	98,021,167
September	12,075,454	77,772,000	17,000,000	94,772,000	685,775	1,909,137	97,366,912
October	12,425,044	81,677,960	16,000,000	97,677,960	801,996	2,176,080	100,656,036
November	12,476,226	77,835,890	18,000,000	95,835,890	777,087	2,128,896	98,741,873
December	12,773,697	77,956,880	16,000,000	93,956,880	657,965	2,116,891	96,731,736
1916.							
January	12,702,343	83,138,964	13,000,000	96,138,964	734,494	2,142,624	99,016,082
February	12,660,711	82,362,963	11,000,000	93,362,963	720,813	2,009,965	96,093,741
March	12,451,062	81,807,921	11,000,000	92,807,921	798,976	2,173,198	95,780,095

[1] Storage includes oil in producers' tanks, in marketing companies' tanks, and in pipe-line companies' tanks.

[2] Pipe-line stocks include oil in transit. (Some pipe lines also hold oil in storage, see note 1.)

[3] Statistics compiled from reports of U. S. Geological Survey, the Oil and Gas Journal, Standard Oil Bulletin, company reports, and California Derrick. The figures covering stocks held by producers in Kansas-Oklahoma are approximations by the Oil and Gas Journal.

TABLE 15.—STOCKS (BARRELS) OF CRUDE OIL OF SPECIFIED FIELDS IN STORAGE AND IN PIPE LINES, AS REPORTED TO THE FEDERAL TRADE COMMISSION, AT THE END OF EACH MONTH, JANUARY, 1915, TO MARCH, 1916, INCLUSIVE—Continued.

Year and month.	Illinois.	Gulf coast.	Wyoming.[1]	California.	Grand total.
1915.					
January	11,064,589	4,266,396	.....	59,276,301	160,207,042
February	11,283,403	4,544,130	.....	60,527,306	163,479,860
March	12,175,272	4,805,900	.....	60,777,316	163,374,608
April	12,779,960	5,025,804	34,861	60,656,177	170,087,881
May	13,387,241	5,040,717	34,861	60,820,315	173,926,328
June	13,717,404	4,661,307	34,861	60,616,286	175,443,605
July	13,095,345	4,924,666	34,674	60,409,979	191,205,591
August	12,977,384	5,202,955	42,746	60,162,277	188,217,484
September	12,634,297	5,427,497	53,093	59,624,905	187,182,158
October	12,443,263	6,099,989	68,649	58,673,592	190,366,573
November	12,165,960	6,786,189	79,135	57,789,959	188,039,342
December	11,854,950	7,022,405	104,304	57,147,051	185,634,143
1916.					
January	11,366,470	(2)	116,118	57,035,887	180,236,899
February	10,906,139	(2)	127,172	56,021,093	175,808,856
March	10,525,333	(2)	108,607	54,975,705	173,840,802

[1] Includes Montana. [2] Data not reported.

TABLE 16.—STOCKS OF CRUDE OIL IN MID-CONTINENT FIELD IN STANDARD AND OTHER PIPE LINES AND IN TANKS OF STANDARD AND OTHER PRODUCING COMPANIES, JANUARY, 1915, TO MARCH, 1916, INCLUSIVE.[1]

Year and month.	Standard pipe lines and producers.		Other pipe lines and producers.				Total.	
			Pipe lines.		Oklahoma producers.			
	Barrels.	Per cent.	Barrels.	Per cent.	Barrels.	Per cent.	Barrels.	Per cent.
1915.								
January	43,607,192	58.5	10,924,350	14.7	20,000,000	26.8	74,531,542	100.0
February	43,758,506	57.7	11,052,390	14.6	21,000,000	27.7	75,810,896	100.0
March	43,129,000	58.1	11,114,669	14.9	20,000,000	26.9	74,243,669	100.0
April	43,499,777	54.5	11,257,890	14.1	25,000,000	31.4	79,757,667	100.0
May	43,558,567	52.5	11,360,381	13.7	28,000,000	33.8	82,918,948	100.0
June	43,037,094	51.0	11,356,916	13.5	30,000,000	35.5	84,394,010	100.0
July	43,746,237	44.1	13,557,601	13.6	42,000,000	42.3	99,303,838	100.0
August	53,623,012	55.8	13,537,164	14.1	29,000,000	30.1	96,160,176	100.0
September	63,642,594	66.7	14,815,181	15.5	17,000,000	17.8	95,457,775	100.0
October	65,647,862	66.7	16,832,094	17.1	16,000,000	16.2	98,479,956	100.0
November	61,652,916	63.8	16,960,061	17.6	18,000,000	18.6	96,612,977	100.0
December	60,496,891	63.9	18,117,954	19.2	16,000,000	16.9	94,614,845	100.0
1916.								
January	65,763,500	67.9	18,109,958	18.7	13,000,000	13.4	96,873,458	100.0
February	64,718,194	68.8	18,365,582	19.5	11,000,000,	11.7	94,083,776	100.0
March	63,985,308	68.4	18,621,589	19.9	11,000,000	11.7	93,606,897	100.0

[1] Northwest Louisiana stocks not included.

TABLE 17.—STOCKS OF CRUDE OIL IN ILLINOIS AND EASTERN FIELDS IN STANDARD AND OTHER PIPE LINES, AND IN STORAGE WITH SUCH LINES,[1] JANUARY, 1915, TO MARCH, 1916, INCLUSIVE.

Year and month.	Standard lines.		Other lines.		Total.	
	Barrels.	Per cent.	Barrels.	Per cent.	Barrels.	Per cent.
1915.						
January	13,216,452	94.8	724,783	5.2	13,941,235	100.0
February	13,829,663	94.8	758,239	5.2	14,587,902	100.0
March	14,701,654	94.9	786,698	5.1	15,488,352	100.0
April	15,589,152	95.0	815,782	5.0	16,404,934	100.0
May	15,662,213	95.0	832,796	5.0	16,495,009	100.0
June	15,997,765	95.0	841,498	5.0	16,839,263	100.0
July	16,052,279	94.9	860,463	5.1	16,912,742	100.0
August	15,429,902	94.9	837,573	5.1	16,267,475	100.0
September	15,430,620	94.8	842,494	5.2	16,273,114	100.0
October	15,336,984	94.8	837,699	5.2	16,174,683	100.0
November	15,145,851	95.3	742,128	4.7	15,887,979	100.0
December	15,270,990	95.3	755,912	4.7	16,026,902	100.0
1916.						
January	15,237,560	96.2	608,408	3.8	15,845,968	100.0
February	15,352,127	96.4	575,572	3.6	15,927,699	100.0
March	15,211,336	96.3	584,187	3.7	15,795,523	100.0

[1] Includes credit balances held for producers.

TABLE 18.—STOCKS OF CRUDE OIL IN STANDARD PIPE LINES AND TANKS AND IN ALLIED PRODUCING COMPANIES' TANKS AND IN OTHER PIPE LINES AND PRODUCERS' TANKS IN MID-CONTINENT[1] AND ILLINOIS AND EASTERN FIELDS, AS REPORTED TO THE FEDERAL TRADE COMMISSION, JANUARY, 1915, TO MARCH, 1916, INCLUSIVE.

Year and month.	Standard lines and producers.		Other lines and producers.[2]		Total.	
	Barrels.	Per cent.	Barrels.	Per cent.	Barrels.	Per cent.
1915.						
January	64,212,394	67.0	31,649,133	33.0	95,862,527	100.0
February	64,818,123	66.4	32,810,629	33.6	97,628,752	100.0
March	65,112,295	67.1	31,901,367	32.9	97,013,662	100.0
April	66,404,095	64.2	37,073,672	35.8	103,477,767	100.0
May	66,713,597	62.4	40,193,177	37.6	106,906,774	100.0
June	66,644,910	61.2	42,198,414	38.8	108,843,324	100.0
July	67,750,055	54.6	56,418,064	45.4	124,168,119	100.0
August	77,573,778	64.1	43,374,737	35.9	120,948,515	100.0
September	87,509,851	72.8	32,657,675	27.2	120,167,526	100.0
October	89,678,470	72.7	33,669,793	27.3	123,348,263	100.0
November	85,552,974	70.6	35,702,189	29.4	121,255,163	100.0
December	84,369,626	70.8	34,873,866	29.2	119,243,492	100.0
1916.						
January	89,223,904	73.8	31,718,366	26.2	120,942,270	100.0
February	87,709,472	74.6	29,941,154	25.4	117,650,626	100.0
March	86,377,515	74.1	30,205,776	25.9	116,583,291	100.0

[1] Northwest Louisiana stocks not included.

[2] Including Kansas-Oklahoma producers, as shown in Table 15, p. 185.

TABLE 19.—CRUDE OIL STOCKS HELD BY THE CARTER OIL CO., PRAIRIE OIL & GAS CO., AND OTHER OKLAHOMA PRODUCERS, JANUARY, 1915, TO MARCH, 1916, INCLUSIVE.

Year and month.	Carter Oil Co.		Prairie Oil & Gas Co.		Other Oklahoma producers.		Total.	
	Barrels.	Per cent.	Barrels.	Per cent.	Barrels.	Per cent.	Barrels.	Per cent.
1915.								
January	.....	.....	42,855,092	68.2	20,000,000	31.8	62,855,092	100.0
February	.....	.....	42,000,000	66.7	21,000,000	33.3	63,000,000	100.0
March	.....	.....	41,590,000	67.5	20,000,000	32.5	61,590,000	100.0
April	.....	.....	42,000,000	62.7	25,000,000	37.3	67,000,000	100.0
May	.....	.....	42,000,000	60.0	28,000,000	40.0	70,000,000	100.0
June	.....	.....	41,500,000	58.0	30,000,000	42.0	71,500,000	100.0
July	.....	.....	42,000,000	50.0	42,000,000	50.0	84,000,000	100.0
August	9,000,000	11.1	43,000,000	53.1	29,000,000	35.8	81,000,000	100.0
September	18,000,000	22.8	44,000,000	55.7	17,000,000	21.5	79,000,000	100.0
October	20,000,000	25.0	44,000,000	55.0	16,000,000	20.0	80,000,000	100.0
November	17,000,000	21.8	43,000,000	55.1	18,000,000	23.1	78,000,000	100.0
December	19,000,000	25.3	40,000,000	53.3	16,000,000	21.3	75,000,000	100.0
1916.								
January	20,000,000	26.3	43,000,000	56.6	13,000,000	17.1	76,000,000	100.0
February	20,000,000	27.4	42,000,000	57.5	11,000,000	15.1	73,000,000	100.0
March	20,000,000	27.7	41,250,000	57.1	11,000,000	15.2	72,250,000	100.0

TABLE 20.—CRUDE OIL HELD IN STORAGE FOR PRODUCERS BY EASTERN PIPE LINE COMPANIES REPORTING TO THE COMMISSION, JANUARY, 1915, TO MARCH, 1916.

Year and month.	Barrels.	Year and month.	Barrels.
1915.		1915,	
January	743,708	September	1,625,057
February	740,429	October	1,887,030
March	870,146	November	2,284,843
April	784,346	December	2,093,175
May	882,666	1916.	
June	1,089,010	January	2,079,269
July	1,080,070	February	2,163,173
August	1,213,908	March	2,174,496

TABLE 21.—STOCKS OF CRUDE OIL HELD BY STANDARD AND OTHER REFINERIES REPORTING TO THE COMMISSION, JANUARY 1, 1915, JULY 1, 1915, AND JANUARY 1, 1916.

Date.	Refineries.					
	Standard.		Other.		Total.	
	Barrels.	Per cent.	Barrels.	Per cent.	Barrels.	Per cent.
Jan. 1, 1915	31,400,257	81.8	6,998,247	18.2	38,398,504	100.0
July 1, 1915	34,847,808	71.1	14,183,359	28.9	49,031,167	100.0
Jan. 1, 1916	40,369,729	74.9	13,528,402	25.1	53,898,131	100.0

TABLE 22.—COMBINED STOCKS OF CRUDE OIL HELD BY PIPE LINES, PRODUCERS, AND REFINERS REPORTING TO THE COMMISSION, JANUARY 1, 1915, JULY 1, 1915, AND JANUARY 1, 1916.

Date.	Stocks held by—					
	Pipe lines and producers.		Refiners.		Total.	
	Barrels.	Per cent.	Barrels.	Per cent.	Barrels.	Per cent.
Jan. 1, 1915	136,385,938	81.2	38,398,504	18.8	204,784,442	100.0
July 1, 1915	175,443,605	78,2	49,031,167	21.8	224,474,772	100.0
Jan. 1, 1916	185,634,143	77.5	53,898,131	22.5	239,532,274	100.0
Increase, Jan. 1, 1916	19,248,205	11.6	15,464,627	40.2	34,712,832	17.0

TABLE 23.—NUMBER OF OIL WELLS DRILLED IN THE VARIOUS OIL FIELDS IN THE UNITED STATES, JANUARY 1, 1913, TO APRIL 1, 1916.[1]

Year and month.	Appalachian.		Lima-Indiana.		Illinois.		Mid-Continent.		Gulf coast.		California.	
	Oil.	Dry.	Oil.	Dry.	Oil.	Dry.	Oil.	Dry.	Oil.	Dry.	Oil.	Dry.
1913.												
January	317	96	51	6	106	23	488	111	31	9	.....	.....
February	318	111	48	3	83	22	553	98	30	25	.....	.....
March	394	106	70	11	71	12	514	100	43	16	.....	.....
April	466	126	45	10	92	13	624	76	42	45	.....	.....
May	541	112	87	10	137	21	811	162	26	16	.....	.....
June	632	139	89	11	112	35	867	191	40	41	.....	.....
July	569	139	112	13	139	28	880	237	48	33	.....	.....
August	595	155	130	22	116	38	927	176	43	34	.....	.....
September	580	142	101	28	145	16	839	139	29	22	.....	.....
October	601	132	115	23	151	31	881	177	27	22	.....	.....
November	565	121	120	15	115	24	953	184	21	17	.....	.....
December	506	153	118	24	96	15	987	217	26	32	.....	.....
Total	6,084	1,532	1,086	176	1,363	278	9,324	1,868	406	312	789	67
1914.												
January	445	117	120	22	126	15	976	211	45	5	.....	.....
February	364	133	119	31	103	28	921	185	26	8	.....	.....
March	321	88	107	33	116	18	1,067	226	26	13	.....	.....
April	524	137	107	38	148	41	1,026	263	24	21	.....	.....
May	531	141	168	37	116	35	1,113	246	45	14	.....	.....
June	489	135	154	48	123	52	949	155	35	12	.....	.....
July	463	121	129	30	98	37	734	144	43	24	.....	.....
August	375	113	111	26	98	39	639	104	35	26	.....	.....
September	198	76	89	25	111	28	562	104	28	10	.....	.....
October	197	70	49	13	69	27	373	87	25	18	.....	.....
November	177	69	33	11	48	14	269	90	34	18	.....	.....
December	188	57	49	14	35	22	333	110	29	9	.....	.....
Total	4,272	1,257	1,235	328	1,191	356	8,962	1,925	395	178	465	47

[1] Figures for 1913–14 from Geological Survey; for 1915 and 1916 from Oil and Gas Journal. Figures for California from Standard Oil Bulletin. In the Appalachian field a considerable number of gas wells were drilled, which are not included.

TABLE 23.—NUMBER OF OIL WELLS DRILLED IN THE VARIOUS OIL FIELDS IN THE UNITED STATES, JANUARY 1, 1913, TO APRIL 1, 1916—Continued.

Year and month.	Appalachian.		Lima-Indiana.		Illinois.		Mid-Continent.		Gulf coast.		California.	
	Oil.	Dry.	Oil.	Dry.	Oil.	Dry.	Oil.	Dry.	Oil.	Dry.	Oil.	Dry.
1915.												
January	185	90	14	10	31	16	289	75	24	6	20	5
February	167	75	29	7	22	13	305	82	28	7	19	1
March	211	83	23	5	41	11	247	75	22	13	23	4
April	225	73	29	9	43	10	307	69	34	36	17	4
May	237	87	23	10	33	19	271	51	54	32	23	4
June	157	82	18	11	36	16	276	61	58	61	14	.....
July	237	88	21	16	46	17	259	67	45	44	28	3
August	250	105	23	10	52	18	297	86	50	29	12	2
September	236	80	27	13	49	16	250	94	51	30	30	4
October	304	86	27	8	56	23	471	109	36	22	20	.....
November	335	111	48	13	58	25	679	207	53	36	14	5
December	304	79	41	6	72	22	912	183	47	27	20	2
Total	2,848	1,039	323	118	539	206	4,563	1,159	502	343	240	34
1916.												
January	333	103	36	12	60	26	720	105	59	36	35	3
February	307	83	30	15	58	18	704	129	66	38	33	1
March	276	87	58	13	87	29	894	180	81	30	34	1

TABLE 24.—ESTIMATED GASOLINE CONTENT (GALLONS) OF THE CRUDE OIL PRODUCED IN THE UNITED STATES DURING 1915.

Month.	Field.						
	Appalachian.	Lima-Indiana.	Illinois.	Kansas-Oklahoma.			
				Cushing.	Healdton.	Other Kansas-Oklahoma.	Total Kansas-Oklahoma.
January	15,951,600	2,230,200	13,557,600	86,953,440	819,000	31,637,340	119,409,780
February	15,405,600	2,268,000	12,952,800	67,173,120	126,000	29,732,220	97,031,340
March	17,127,600	2,444,400	14,792,400	81,343,920	218,400	31,875,480	113,437,800
April	16,825,200	2,494,800	13,801,200	101,818,080	567,000	29,820,420	132,205,500
May	15,817,200	2,261,700	13,767,600	87,858,960	588,000	32,766,300	121,213,260
June	16,497,600	2,356,200	13,473,600	94,115,280	924,000	29,776,320	124,815,600
July	16,338,000	2,293,200	13,750,800	74,370,240	1,554,000	32,907,420	108,831,660
August	15,825,600	2,154,600	13,381,200	66,079,440	1,457,400	32,854,500	100,391,340
September	15,691,200	2,135,700	12,894,000	50,097,600	2,520,000	33,330,780	85,948,380
October	15,380,400	2,173,500	12,885,600	44,934,960	3,351,600	35,668,080	83,954,640
November	15,019,200	2,016,000	12,196,800	39,866,400	5,040,000	35,959,140	80,865,540
December	16,153,200	2,066,400	12,490,800	36,891,120	9,765,000	38,825,640	85,481,760
Total	192,032,400	26,894,700	159,944,400	831,502,560	26,930,400	395,153,640	1,253,586,600

TABLE 24.—ESTIMATED GASOLINE CONTENT (GALLONS) OF THE CRUDE OIL PRODUCED IN THE UNITED STATES DURING 1915—Continued.

Month.	Field.					
	North Texas.	Northwest Louisiana.	Wyoming.[1]	Gulf coast.	California.	Grand total.
January	5,266,800	6,543,600	3,066,000	1,499,400	8,082,900	175,607,880
February	4,746,000	7,375,200	2,368,800	1,792,980	7,296,450	151,237,170
March	5,157,600	8,752,800	3,192,000	1,850,940	7,945,350	174,700,890
April	5,527,200	9,517,200	1,898,400	1,803,060	7,703,850	191,776,410
May	6,342,000	10,407,600	2,200,800	1,572,480	8,071,350	181,653,990
June	5,703,600	10,071,600	3,250,800	1,674,540	7,816,200	185,659,740
July	5,392,800	12,180,000	3,217,200	1,964,340	8,125,950	172,093,950
August	5,140,800	13,692,000	3,855,600	1,872,360	8,064,000	164,377,500
September	5,098,800	12,927,600	3,318,000	2,366,280	7,696,500	148,076,460
October	4,964,400	10,768,800	4,006,800	3,070,620	8,058,750	145,263,510
November	4,880,400	10,164,000	3,469,200	3,558,240	7,584,150	139,753,530
December	5,082,000	9,954,000	3,704,400	2,901,780	7,766,850	145,601,190
Total	63,302,400	[2] 130,636,800	37,548,000	25,927,020	94,212,300	[3] 2,059,084,620

[1] Includes Colorado.

[2] This total includes the gasoline content of crude oil run by three independent refineries at Shreveport, La. The quantity run has not been segregated by months.

[3] This total includes the additional quantity covered by note 2, also 75,000,000 gallons obtained from natural gas.

TABLE 25.—QUANTITY OF GASOLINE PRODUCED BY REFINERIES REPORTING TO THE COMMISSION, BY MONTHS, 1915.

Month.	Standard companies.		Other companies.		Total.	
	Gallons.	Per cent.	Gallons.	Per cent.	Gallons.	Per cent.
January	56,017,020	60.8	36,191,566	39.2	92,208,586	100.0
February	50,623,128	58.1	36,566,337	41.9	87,189,465	100.0
March	58,767,622	58.2	42,165,239	41.8	100,932,861	100.0
April	67,894,449	60.7	44,034,224	39.3	111,928,673	100.0
May	68,005,436	57.8	49,598,797	42.2	117,604,233	100.0
June	60,214,453	53.7	51,833,739	46.3	112,048,192	100.0
July	68,098,911	55.0	55,635,188	45.0	123,734,099	100.0
August	65,566,320	56.8	49,920,558	43.2	115,486,878	100.0
September	63,882,267	54.8	52,723,746	45.2	116,606,013	100.0
October	67,952,569	56.3	52,773,917	43.7	120,726,486	100.0
November	60,421,434	52.4	54,976,533	47.6	115,397,967	100.0
December	67,629,559	56.4	52,225,155	43.6	119,854,714	100.0
Total	755,073,168	56.6	578,644,999	43.4	1,333,718,167	100.0
Estimated quantity of gasoline extracted from natural gas in 1915					75,000,000	.....
Grand total					1,408,718,167	.....

TABLE 26.—PURCHASES OF GASOLINE (GALLONS) BY ALL REFINERS AND JOBBERS REPORTING TO THE COMMISSION, BY MONTHS, 1915.

Month.	Standard companies.			Other companies.			Grand total.
	Refiners.	Jobbers.	Total.	Refiners.	Jobbers.	Total.	
January	6,247,653	4,008,984	10,256,637	2,822,423	1,540,165	4,362,588	14,619,225
February	5,930,406	2,140,519	8,070,925	2,098,535	1,591,417	3,690,252	11,761,177
March	8,257,880	4,272,594	12,530,474	2,453,014	2,349,044	4,802,058	17,332,532
April	13,772,062	5,292,231	19,064,293	2,733,208	3,496,184	6,229,392	25,293,685
May	17,057,348	9,358,608	26,415,956	3,778,646	3,882,668	7,661,314	34,077,270
June	20,936,244	9,481,127	30,417,371	3,628,473	3,673,506	7,301,979	37,719,350
July	28,386,913	6,663,828	35,050,741	6,191,957	4,228,444	10,420,401	45,471,142
August	28,930,954	9,868,445	38,799,399	8,802,308	4,420,549	13,222,857	52,022,256
September	29,262,256	9,723,607	38,985,863	7,494,847	3,870,905	11,365,752	50,351,615
October	28,487,551	7,208,858	35,696,409	7,238,460	4,106,005	11,344,465	47,040,874
November	19,333,457	10,106,946	29,440,403	5,615,403	3,803,661	9,419,064	38,859,467
December	20,240,568	5,393,679	25,634,247	5,149,211	3,320,505	8,469,716	34,103,963
Total	226,843,292	83,519,426	310,362,718	58,006,785	40,283,053	98,289,838	408,652,556

TABLE 27.—STOCKS OF GASOLINE (GALLONS) HELD BY REFINERS AND JOBBERS REPORTING TO THE COMMISSION AT THE BEGINNING OF EACH MONTH, JANUARY 1, 1915, TO JANUARY 1, 1916, INCLUSIVE.

Year and month.	Stocks on hand.				Total stocks on hand with refiners and jobbers.
	Refiners.		Jobbers.		
	Standard.	Other.	Standard.	Other.	
1915.					
January	180,444,003	56,775,782	12,309,438	3,046,448	252,575,671
February	204,210,913	65,925,913	12,753,903	2,880,755	285,771,484
March	225,954,678	73,939,564	11,559,977	3,123,512	314,577,731
April	241,131,287	80,413,477	11,621,994	3,569,246	336,736,004
May	247,274,311	74,848,334	10,562,705	3,651,480	336,236,830
June	245,701,755	67,685,578	13,132,496	4,144,178	330,664,007
July	221,600,075	61,050,274	14,903,028	3,850,988	301,404,365
August	205,527,901	54,576,196	13,795,622	3,638,963	277,538,682
September	175,187,374	44,141,567	14,908,848	3,293,910	237,531,699
October	144,653,424	39,779,367	15,281,999	2,950,976	202,665,766
November	129,420,049	39,728,841	14,328,596	3,120,547	186,598,033
December	119,249,649	40,066,859	16,659,496	3,457,847	179,433,851
1916.					
January	133,396,406	46,036,236	15,988,582	4,023,383	199,434,607

TABLE 28.—GROSS SALES[1] OF GASOLINE (GALLONS) BY ALL REFINERS AND JOBBERS REPORTING TO THE COMMISSION, BY MONTHS, 1915.

Month.	Standard companies.			Other companies.			Grand total.
	Refiners.	Jobbers.	Total.	Refiners.	Jobbers.	Total.	
January	39,686,172	3,561,417	43,247,589	29,143,672	1,581,111	30,724,783	73,972,372
February	35,036,167	3,299,971	38,336,138	29,477,765	1,349,398	30,827,163	69,163,301
March	51,325,660	4,200,420	55,526,080	36,989,987	1,888,824	38,878,811	94,404,891
April	74,182,274	6,357,429	80,539,703	53,804,040	3,433,071	57,237,111	137,776,814
May	88,123,675	6,426,715	94,550,390	59,860,498	3,444,430	63,304,928	157,855,318
June	103,374,622	7,309,732	110,684,354	61,416,154	3,950,678	65,366,832	176,051,186
July	112,774,830	7,880,265	120,655,095	68,548,724	4,469,655	73,018,379	193,673,474
August	122,897,736	8,770,970	131,668,706	68,820,803	4,578,584	73,399,387	205,068,093
September	120,573,082	8,750,965	129,324,047	66,906,257	4,296,236	71,202,493	200,526,540
October	109,970,915	8,357,589	118,328,504	60,501,477	3,945,581	64,447,058	182,775,562
November	87,716,518	7,601,620	95,318,138	59,456,761	3,437,430	62,894,191	158,212,329
December	72,164,417	5,859,264	78,023,681	52,576,319	2,795,376	55,371,695	133,395,376
Total	1,017,826,068	78,376,357	1,096,202,425	647,502,457	39,170,374	686,672,831	1,782,875,256

[1] The figures shown as "Gross sales" contain an element of duplication, as the same gasoline may have been sold by a refiner to a jobber, who in turn sold to a marketing refiner.

TABLE 29.—SALES OF GASOLINE AND NAPHTHA (GALLONS) BY REFINERS TO JOBBERS AND CONSUMERS BY ALL REFINERS REPORTING TO THE COMMISSION, BY MONTHS, 1915.

Month.	Standard refiners.	Other refiners.	Total.
January	48,345,954	28,514,050	76,860,004
February	48,747,749	27,878,737	76,626,486
March	65,137,941	34,400,175	99,538,116
April	90,609,939	51,199,171	141,809,110
May	103,154,397	55,378,254	158,532,651
June	122,806,431	59,395,699	182,202,130
July	133,379,746	65,674,050	199,053,796
August	149,695,699	67,358,261	217,053,960
September	139,284,526	65,567,686	204,852,212
October	119,536,887	60,972,180	180,509,067
November	109,764,793	59,512,096	169,276,889
December	91,340,763	51,634,516	142,975,279
Total	1,221,804,825	627,484,875	1,849,289,700
Quantity undistributed		500,000	500,000
Grand total	1,221,804,825	627,984,875	1,849,789,700

TABLE 30.—EXPORTS OF GASOLINE, NAPHTHA, AND BENZINE (COMBINED), BY MONTHS, 1915.[1]

	Gallons.		Gallons.
1915.		1916.	
January	13,624,708	January	17,129,972
February	23,346,701	February	17,737,600
March	22,034,941	March	28,644,240
April	24,259,214	April	19,856,835
May	25,117,025	Annual totals:	
June	28,372,830	1915[2]	282,331,474
July	24,947,975	1914	209,692,655
August	33,067,432	1913	188,043,379
September	21,035,160	Per cent of total gasoline content of	
October	18,543,754	1915 crude exported during 1915	14
November	27,424,510		
December	22,895,570		

[1] The foregoing statistics are taken from the monthly reports of the Bureau of Foreign and Domestic Commerce. At the end it is shown that the total exports of all volatile petroleum products during 1915 were equal to 14 per cent of the total estimated gasoline content of all the crude petroleum produced in the United States during 1915, as estimated in Table 24.

[2] Total for 1915 is the figure as corrected by the Bureau at the end of the year and does not equal the total of the figures for the months.

TABLE 31.—EXPORTS OF GASOLINE, NAPHTHA, AND BENZINE (COMBINED)[1] BY VARIOUS REFINERS REPORTING TO THE COMMISSION, TOGETHER WITH PERCENTAGES OF THE TOTAL, 1914–1915.

Company.	1914		1915	
	Gallons.	Per cent of total.	Gallons.	Per cent of total
Standard Oil companies:				
Standard Oil Co. (New Jersey)	108,882,186	52.0	179,982,931	57.1
Magnolia Petroleum Co	24,639,006	11.8	36,018,970	11.4
Atlantic Refining Co	25,249,974	12.0	25,198,312	8.0
Standard Oil Co. of New York	14,102,644	6.7	10,243,767	3.2
Vacuum Oil Co	1,665,803	.8	3,050,838	1.0
Standard Oil Co. (Kansas)			3,811,684	1.2
Standard Oil Co. (Indiana)			2,006,784	.6
Standard Oil Co. (California)			983,387	.3
Total	174,539,613	83.3	261,296,673	82.8
Other companies:				
Union Petroleum Co	10,592,000	5.1	15,783,000	5.0
The Texas Co	11,244,226	5.4	10,623,415	3.4
Midwest Refining Co	3,626,657	1.7	7,099,948	2.3
Cosden & Co	4,905,423	2.3	4,850,000	1.5
Milliken Refining Co	1,373,064	.7	4,916,715	1.6
Consumers Refining Co	1,222,569	.6	3,487,578	1.1
Constantin Refining Co	531,327	.2	619,594	.2
Indian Refining Co	419,392	.2	445,206	.1
Sapulpa Refining Co	219,700	.1	270,000	.1
Kanotex Refining Co	316,110	.1	44,883	.0
Gulf Refining Co			2,784,124	.9

[1] The gravity of the gasoline exported was reported by 7 companies, and ranged from 58° to 65°, with 64° most common.

TABLE 31.—EXPORTS OF GASOLINE, NAPHTHA, AND BENZINE (COMBINED) BY VARIOUS REFINERS REPORTING TO THE COMMISSION, TOGETHER WITH PERCENTAGES OF THE TOTAL, 1914-1915—Continued.

Company.	1914		1915	
	Gallons.	Per cent of total.	Gallons.	Per cent of total.
Other companies—Continued.				
Ardmore Refining Co.	.....	.....	1,056,720	0.3
Union Oil Co. of California	.....	.....	978,216	.3
American Refining Co.	.....	.....	272,000	.1
Cudahy Refining Co.	.....	.....	139,528	.1
Associated Oil Co.	.....	.....	42,065	.0
Chanute Refining Co.	556,763	.3	768,900	.2
Total	35,007,231	16.7	54,181,892	17.2
Grand total	209,546,844	100.0	315,478,565	100.0

TABLE 32.—NUMBER OF GASOLINE ENGINES SOLD IN FOREIGN AND DOMESTIC MARKETS BY 270 MANUFACTURERS REPORTING TO THE COMMISSION, TOGETHER WITH THE TOTAL HORSEPOWER OF SUCH ENGINES, 1913-1915.

Kind of motor.	1913			
	Domestic.		Foreign.	
	Number sold.	Total horsepower.[1]	Number sold.	Total horsepower.[1]
Automobile and auto motors	309,654	7,255,093	13,464	289,615
Commercial trucks and truck motors	9,119	306,879	187	5,260
Tractors and tractor motors	2,532	76,491	30	1,050
Power boats and power boat and marine engines	128,110	2,427,563	8,984	83,382
Stationary engines	62,413	229,365	3,486	14,160
Portable engines	51,553	983,752	2,144	33,451
Total	563,381	11,279,143	28,295	426,918

Kind of motor.	1914			
	Domestic.		Foreign.	
	Number sold.	Total horsepower.[1]	Number sold.	Total horsepower.[1]
Automobile and auto motors	435,747	10,125,322	18,011	380,248
Commercial trucks and truck motors	10,761	324,503	2,322	74,114
Tractors and tractor motors	2,965	99,454	81	4,671
Power boats and power boat and marine engines	130,330	2,457,769	12,043	125,818
Stationary engines	66,734	237,621	2,925	12,930
Portable engines	69,400	642,662	2,620	37,741
Total	715,937	13,887,331	38,002	635,522

[1] Includes estimated horsepower for companies not reporting same. Obtained by using the average of those reporting average horsepower.

TABLE 32.—NUMBER OF GASOLINE ENGINES SOLD IN FOREIGN AND DOMESTIC MARKETS BY 270 MANUFACTURERS REPORTING TO THE COMMISSION, TOGETHER WITH THE TOTAL HORSEPOWER OF SUCH ENGINES, 1913–1915—Continued.

Kind of motor.	1915			
	Domestic.		Foreign.	
	Number sold.	Total horsepower.[1]	Number sold.	Total horsepower.[1]
Automobile and auto motors	707,701	16,676,279	31,000	716,154
Commercial trucks and truck motors	17,671	587,058	13,297	450,724
Tractors and tractor motors	7,145	200,380	396	25,998
Power boats and power boat and marine engines	110,748	2,129,557	11,176	80,512
Stationary engines	57,047	210,365	3,030	25,049
Portable engines	158,576	2,721,219	2,389	40,682
Total	1,058,888	22,524,858	61,288	1,339,119

[1] Includes estimated horsepower for companies not reporting same. Obtained by using the average of those reporting average horsepower.

TABLE 33.—MONTHLY AVERAGE F. O. B. REFINERY PRICE OF GASOLINE FOR REFINERS REPORTING TO THE COMMISSION, BY TERRITORIAL GROUPS, 1915.

[Cents per gallon.]

Month.	Kansas-Oklahoma (18 refineries).	Texas-Louisiana (6 refineries).	North Central (5 refineries).	Eastern (33 refineries).	Rocky Mountain.	California (10 refineries).	All refineries.
January	7.08	6.71	8.12	8.82	6.64	8.51	8.19
February	6.65	6.59	7.76	8.80	6.41	7.88	7.86
March	6.45	6.57	7.32	8.38	6.17	8.10	7.61
April	6.34	6.45	6.99	8.18	6.15	8.14	7.47
May	6.37	6.44	6.91	8.23	6.11	8.08	7.50
June	6.03	6.61	6.71	8.45	5.96	8.07	7.52
July	5.99	6.76	6.76	8.68	5.88	7.81	7.59
August	6.34	7.18	6.90	9.16	5.97	7.60	7.92
September	7.32	8.41	7.42	10.59	7.02	7.76	8.99
October	8.73	10.12	9.05	11.86	7.95	9.29	10.38
November	10.15	10.95	10.27	12.83	9.83	10.09	11.48
December	12.17	11.63	12.30	14.37	11.55	10.97	12.97

TABLE 34.—MONTHLY AVERAGE STANDARD TANK-WAGON PRICES BY STANDARD MARKETING TERRITORIES AND STANDARD TANK-WAGON PRICES MINUS FREIGHT BY SUCH TERRITORIES AND BY STATES THEREIN, 1915.

[Cents per gallon.]

1. TERRITORY OF STANDARD OF NEW YORK.

State.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Monthly average tank-wagon price minus freight:												
Connecticut	11.19	10.82	10.56	10.34	10.23	10.68	11.59	13.01	15.26	16.20	17.66	19.56
Maine	12.26	11.94	11.90	11.89	11.89	12.69	12 90	13.48	15.70	16.67	18.13	20.03
Massachusetts	12.62	12.30	12.30	12.30	12.30	13.10	13.30	13.88	16.10	17.07	18.53	20.43
New Hampshire	12.27	11.98	11.95	11.95	11.95	12.76	12.99	13.55	15.77	16.75	18.21	20.09
New York	11.19	11.08	10.88	10.62	10.49	11.21	11.80	12.88	14.72	15.95	17.39	19.27
Rhode Island	12.75	12.43	12.43	12.43	12.43	13.23	13.43	14.01	16.23	17.20	18.66	20.56
Vermont	11.79	11.82	11.76	11.60	11.60	12.44	12.77	13.36	15.62	16.62	18.05	19.92
Average for the territory	11.82	11.58	11.47	11.36	11.31	12.04	12.46	13.28	15.42	16.44	17.88	19.76
Monthly average tank-wagon price for the territory	12.71	12.45	12.35	12.24	12.20	12.92	13.34	14.20	16.38	17.35	18.80	20.70

2. TERRITORY OF ATLANTIC REFINING CO.

Monthly average tank-wagon price minus freight:												
Delaware	10.43	10.42	10.40	10.40	10.40	10.40	10.40	10.92	12.77	13.40	14.83	16.82
Pennsylvania	10.43	10.36	10.29	10.27	10.11	10.11	10.11	10.60	12.46	13.27	14.70	16.69
Average for the territory	10.43	10.37	10.30	10.28	10.13	10.13	10.13	10.63	12.49	13.28	14.71	16.70
Monthly average tank-wagon price for the territory	11.15	11.11	11.07	11.05	10.92	10.92	10.91	11.41	13.28	14.07	15.50	17.49

3. TERRITORY OF STANDARD OF NEW JERSEY.

Monthly average tank-wagon price, minus freight:												
District of Columbia	11.99	11.35	11.35	11.35	11.35	10.90	10.85	11.53	13.95	15.69	16.12	18.81
Maryland	11.92	11.86	11.75	11.64	11.64	11.54	11.35	11.87	13.91	16.35	16.73	18.58
North Carolina	13.14	12.69	12.69	12.67	12.65	12.63	12.76	13.26	15.47	16.43	16.85	19.25
New Jersey	8.96	8.89	8.87	8.84	9.25	10.29	11.19	11.76	13.94	15.23	16.83	18.58
South Carolina	13.47	13.13	13.10	13.06	12.96	12.75	12.70	13.31	15.91	16.97	17.38	19.72
Virginia	12.26	11.99	11.81	11.68	11.63	11.44	11.42	11.69	13.34	15.45	16.17	18.91
West Virginia	12.65	12.17	12.12	12.02	11.96	11.92	11.76	11.92	12.83	15.25	16.15	19.12
Average for the territory	12.15	11.86	11.79	11.72	11.74	11.80	11.89	12.32	14.62	15.94	16.67	19.06
Monthly average tank-wagon price for the territory	13.38	13.08	13.01	12.94	12.98	13.04	13.17	13.63	15.54	17.16	17.80	20.17

TABLE 34.—MONTHLY AVERAGE STANDARD TANK-WAGON PRICES BY STANDARD MARKETING TERRITORIES AND STANDARD TANK-WAGON PRICES MINUS FREIGHT BY SUCH TERRITORIES AND BY STATES THEREIN, 1915—Continued.

[Cents per gallon.]

4. TERRITORY OF STANDARD OF OHIO.

State.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Monthly average tank-wagon price minus freight:												
Ohio	10.96	10.35	10.31	10.30	10.30	9.92	9.90	9.66	10.79	12.29	14.22	16.48
Average for the territory	10.96	10.35	10.31	10.30	10.30	9.92	9.90	9.66	10.79	12.29	14.22	16.48
Monthly average tank-wagon price for the territory	11.61	11.00	10.97	10.95	10.95	10.57	10.55	10.30	11.44	12.94	14.87	17.13

5. TERRITORY OF STANDARD OF INDIANA.

Monthly average tank-wagon price minus freight:												
Illinois	10.72	10.37	10.00	10.00	10.00	9.19	8.99	8.99	9.59	11.22	12.82	14.67
Indiana	10.36	10.22	9.83	9.83	9.83	9.03	8.83	8.83	9.43	11.06	12.66	14.51
Iowa	9.92	9.80	9.43	9.43	9.43	8.73	8.43	8.43	9.03	10.68	12.28	14.13
Kansas	10.13	10.01	9.63	9.64	9.64	8.94	8.64	8.64	9.24	10.87	12.47	14.32
Michigan	10.18	10.05	9.67	9.67	9.67	9.27	9.17	9.17	9.78	11.44	13.04	14.88
Minnesota	10.70	10.57	10.20	10.20	10.20	9.44	9.20	9.20	9.80	11.43	13.03	14.88
Missouri	10.17	10.05	9.69	9.65	9.65	8.96	8.68	8.68	9.28	10.91	12.51	14.36
North Dakota	11.47	11.08	10.80	10.80	10.80	10.01	9.71	9.71	10.31	11.94	13.54	15.39
Oklahoma	10.21	10.09	9.71	9.71	9.71	9.01	8.71	8.71	9.31	10.93	12.48	14.33
South Dakota	11.34	11.22	10.84	10.84	10.84	10.14	9.84	9.84	10.44	12.07	13.67	15.52
Wisconsin	10.71	10.59	10.21	10.21	10.21	9.41	9.21	9.20	9.90	11.44	13.04	14.89
Average for the territory	10.45	10.25	9.91	9.90	9.90	9.18	8.95	8.95	9.55	11.19	12.79	14.64
Average, less quantity discount	9.45	9.25	8.91	8.90	8.90	8.18	7.95	7.95	8.55	10.19	12.79	14.64
Monthly average tank-wagon price for the territory	11.51	11.35	10.97	10.95	10.95	10.23	10.01	10.01	10.61	12.24	13.84	15.69
Monthly average tank-wagon price, less quantity discount for the territory	10.51	10.35	9.97	9.95	9.95	9.23	9.01	9.01	9.61	11.24	13.84	15.69

6. TERRITORY OF STANDARD OF KENTUCKY.

Monthly average tank-wagon price minus freight:												
Alabama	13.70	13.68	13.65	13.62	13.59	13.60	13.60	14.01	14.80	15.77	16.09	18.68
Florida	13.79	13.77	13.75	13.53	13.39	13.36	13.33	13.23	14.32	15.40	16.35	18.33
Georgia	13.21	13.14	13.08	13.02	12.91	12.84	12.77	13.10	14.15	15.32	16.42	19.05
Kentucky	11.88	11.83	11.72	11.63	11.43	11.35	11.22	11.29	12.09	13.30	14.65	17.15
Mississippi	12.49	12.49	12.49	12.49	12.43	12.31	12.20	12.61	13.26	14.34	15.40	17.37
Average for the territory	13.00	12.96	12.92	12.84	12.74	12.67	12.61	12.84	13.72	14.83	15.80	18.12
Monthly average tank-wagon price for the territory [1]	15.08	15.05	15.01	14.93	14.83	14.76	14.69	14.93	15.81	16.91	17.89	20.21

[1] Discounts were allowed on large purchases.

TABLE 34.—MONTHLY AVERAGE STANDARD TANK-WAGON PRICES BY STANDARD MARKETING TERRITORIES AND STANDARD TANK-WAGON PRICES MINUS FREIGHT BY SUCH TERRITORIES AND BY STATES THEREIN, 1915—Continued.

[Cents per gallon.]

7. TERRITORY OF STANDARD OF NEBRASKA.

State.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Monthly average tank-wagon price minus freight:												
Nebraska	10.57	9.92	9.49	9.02	9.02	9.00	9.00	9.01	9.56	10.88	13.08	15.16
Average for the territory	10.57	9.92	9.49	9.02	9.02	9.00	9.00	9.01	9.56	10.88	13.08	15.16
Monthly average tank-wagon price for the territory	12.11	11.46	11.03	10.56	10.56	10.54	10.54	10.55	11.10	12.42	14.62	16.70

8. TERRITORY OF STANDARD OF LOUISIANA.

Monthly average tank-wagon price minus freight:												
Arkansas	10.83	10.32	10.31	10.31	10.46	10.71	10.69	11.63	13.69	14.69	15.66	17.51
Louisiana	11.12	11.06	10.93	10.84	11.03	11.34	11.33	12.22	14.58	15.62	15.87	17.39
Tennessee	10.99	10.69	10.57	10.47	10.63	10.94	10.92	11.84	13.91	14.99	15.45	16.78
Average for the territory	11.00	10.73	10.62	10.56	10.72	11.02	11.00	11.92	14.08	15.13	15.65	17.18
Monthly average tank-wagon price for the territory [1]	12.52	12.24	12.13	12.06	12.23	12.54	12.53	13.45	15.61	16.66	17.17	18.71

9. TERRITORY OF MAGNOLIA PETROLEUM CO.

Monthly average tank-wagon price minus freight:												
Arkansas	10.02	9.53	9.38	9.47	9.12	9.93	10.28	10.92	11.98	13.25	13.59	16.89
Oklahoma	11.51	11.44	11.15	11.06	10.94	10.56	10.35	11.00	12.38	14.27	15.29	16.86
Texas	6.76	6.58	6.58	7.51	8.58	9.26	9.57	10.15	11.41	13.32	14.84	15.58
Average for the territory	8.27	8.08	7.99	8.59	9.22	9.65	9.83	10.44	11.70	13.54	14.82	16.03
Monthly average tank-wagon price for the territory	9.70	9.51	9.43	10.01	10.65	11.06	11.27	11.87	13.14	14.98	16.25	17.46

[1] Discounts were allowed on large purchases.

TABLE 34.—MONTHLY AVERAGE STANDARD TANK-WAGON PRICES BY STANDARD MARKETING TERRITORIES AND STANDARD TANK-WAGON PRICES MINUS FREIGHT BY SUCH TERRITORIES AND BY STATES THEREIN, 1915—Continued.

[Cents per gallon.]

10. TERRITORY OF CONTINENTAL OIL CO.

State.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Monthly average tank-wagon price minus freight:												
Colorado	12.23	12.13	11.95	11.41	10.21	9.81	9.16	9.21	10.66	12.13	14.05	16.53
Idaho	12.41	12.37	12.01	11.57	11.04	11.00	10.97	10.77	11.85	13.29	14.95	16.47
Montana	12.34	12.34	12.07	11.84	11.63	11.34	11.34	11.40	12.81	14.31	16.21	18.69
New Mexico	11.86	11.80	11.27	11.09	10.82	10.34	9.99	9.90	11.22	12.75	14.65	17.06
Utah	13.76	13.76	13.25	12.51	11.43	10.85	10.85	10.91	12.32	13.82	15.72	17.85
Wyoming	12.79	12.78	12.78	11.83	11.07	10.73	10.11	10.17	11.61	13.08	14.98	17.46
Average for the territory	12.49	12.44	12.14	11.66	10.91	10.56	10.26	10.26	11.62	13.10	14.97	17.24
Monthly average tank-wagon price for the territory	16.79	16.75	16.45	15.96	15.22	14.90	14.58	14.58	15.94	17.42	19.29	21.57

11. TERRITORY OF STANDARD OF CALIFORNIA.

Monthly average tank-wagon price minus freight:												
Arizona	9.59	9.69	9.74	9.74	9.74	9.73	9.49	9.43	9.64	10.94	11.96	12.83
California	10.42	9.46	9.42	9.42	9.42	9.43	9.03	8.93	9.20	10.99	12.05	12.93
Nevada	.....	.....	.....	.....	.....	.....	9.67	9.67	9.94	11.73	12.80	13.67
Oregon	11.31	10.35	10.31	10.31	10.31	10.31	9.85	9.74	10.00	11.77	12.84	13.71
Washington	10.55	9.63	9.67	9.67	9.67	9.67	9.31	9.22	9.49	11.28	12.34	13.22
Average for the territory	10.54	9.63	9.61	9.61	9.61	9.62	9.23	9.13	9.40	11.16	12.22	13.10
Monthly average tank-wagon price for the territory	11.98	11.07	11.10	11.10	11.09	11.09	10.72	10.62	10.89	12.65	13.72	14.59

TABLE 35.—"NET BACK" (TANK-WAGON PRICE MINUS FREIGHT AND MARKETING COST) ON SALES BY STANDARD AND OTHER COMPANIES IN THE VARIOUS STANDARD MARKETING TERRITORIES, 1915.

[All figures in cents per gallon.]

1. NEW YORK TERRITORY.

Month.	Standard Oil Co. of New York.	Independent refiners.				
		Pure Oil Co.[1]	Corn-planter Refining Co.[2]	Gulf Refining Co.[3]	The Texas Co.[4]	Indian Refining Co.[5]
January	9.02	9.35	7.76	7.87	5.26	5.57
February	8.60	8.90	7.82	7.81	4.22	5.16
March	8.80	9.53	7.80	8.21	5.48	6.59
April	8.05	9.79	8.25	8.41	5.34	6.73
May	9.14	10.05	7.90	8.56	5.77	6.11
June	9.86	10.17	9.01	9.12	5.73	7.54
July	10.08	10.30	9.54	9.57	7.33	8.40
August	11.04	11.14	9.96	10.53	7.66	9.83
September	13.12	13.00	12.39	11.99	10.22	11.17
October	13.95	13.92	12.47	12.82	10.64	12.51
November	15.29	14.74	13.40	14.09	12.03	13.78
December	16.59	17.14	15.15	15.12	13.43	15.07

[1] Averages for New York State only.
[2] Averages for New York, New Hampshire, and Massachusetts.
[3] Averages for Connecticut, Maine, Massachusetts, New Hampshire, New York, and Vermont.
[4] Averages for Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.
[5] Averages for Connecticut and New York.

2. ATLANTIC REFINING CO. TERRITORY.

Month.	Atlantic Refining Co.	Independent refiners.					
		Pure Oil Co.[1]	Corn-planter Refining Co.[2]	Indian Refining Co.[2]	Crew Levick Co.[1]	The Texas Co.[1]	Gulf Refining Co.[2]
January	7.78	9.20	7.64	8.28	7.71	5.55	6.69
February	7.50	9.14	7.24	7.29	7.67	2.60	6.95
March	7.76	9.14	7.56	8.59	7.79	4.91	6.52
April	8.03	9.39	7.02	8.58	7.94	5.30	6.72
May	8.07	9.37	7.16	8.13	7.94	5.74	6.71
June	8.12	9.62	7.49	9.18	8.17	4.28	6.30
July	8.41	9.78	8.54	9.18	8.14	5.63	6.92
August	8.91	9.87	9.11	9.68	8.50	6.21	7.34
September	10.82	11.26	10.91	10.99	10.66	6.36	9.28
October	11.12	12.09	10.61	12.33	11.28	7.81	10.10
November	12.43	13.53	12.51	12.69	12.65	8.54	11.58
December	14.09	15.39	14.10	13.92	14.45	11.23	13.41

[1] Averages for Delaware and Pennsylvania.
[2] Averages for Pennsylvania.

TABLE 35.—"NET BACK" (TANK-WAGON PRICE MINUS FREIGHT AND MARKETING COST) ON SALES BY STANDARD AND OTHER COMPANIES IN THE VARIOUS STANDARD MARKETING TERRITORIES, 1915—Continued.

[All figures in cents per gallon.]

3. NEW JERSEY TERRITORY.

Month.	Standard Oil Co. (N. J.).	Independent refiners.				
		Indian Refining Co.[1]	Pure Oil Co.[2]	The Texas Co.[3]	Crew Levick Co.[4]	Gulf Refining Co.[5]
January	9.06	9.91	6.20	7.24	6.48	6.47
February	8.61	9.46	5.86	6.70	6.50	6.11
March	8.77	9.57	6.20	6.80	6.34	6.58
April	8.72	9.71	6.37	7.31	6.30	6.78
May	8.71	9.28	6.72	6.86	6.53	6.91
June	8.89	9.08	7.92	6.78	7.58	8.52
July	8.97	9.19	9.05	7.93	7.83	8.96
August	9.43	9.63	9.48	5.09	8.80	8.29
September	11.58	11.16	10.86	10.44	11.13	11.71
October	13.21	12.99	12.33	11.67	12.43	12.67
November	14.03	13.47	13.90	12.26	13.80	13.32
December	16.29	15.71	15.23	14.19	15.07	15.30

[1] Averages for States of Maryland, North Carolina, South Carolina, Virginia, and West Virginia.
[2] Averages for Newark, N. J., only.
[3] Averages for States of Maryland, New Jersey, North Carolina, South Carolina, Virginia, West Virginia, and District of Columbia.
[4] Averages for States of Maryland and New Jersey.
[5] Averages for States of New Jersey, North Carolina, and South Carolina.

4. OHIO TERRITORY.

Month.	Standard Oil Co. of Ohio.		Independent refiners.			
	Woodriver, Ill.	Cleveland, Ohio.	Canfield Oil Co.[1]	Indian Refining Co.[2]	Paragon Refining Co.[3]	The Texas Co.[4]
January	7.74	8.27	2.43	7.92	10.26	6.15
February	7.13	7.68	6.61	7.64	9.73	5.41
March	7.45	7.98	6.27	8.08	9.82	6.60
April	7.75	8.28	9.06	8.70	9.66	6.26
May	7.80	8.33	9.26	7.99	9.71	7.17
June	7.42	7.95	8.64	8.57	9.15	7.03
July	7.55	8.10	8.60	8.30	8.74	7.66
August	7.28	7.81	8.53	8.33	8.83	6.34
September	8.49	9.02	9.79	9.49	10.22	7.70
October	9.85	10.41	11.53	11.16	11.61	9.00
November	11.68	12.21	13.10	12.74	13.63	11.06
December	13.53	14.06	14.72	14.85	15.85	13.10

[1] Averages for Akron and Cleveland, Ohio.
[2] Averages for Dayton, Eaton, and Hamilton, Ohio.
[3] Averages for Toledo and Cincinnati, Ohio.
[4] Averages for Youngstown, Ohio.

TABLE 35.—"NET BACK" (TANK-WAGON PRICE MINUS FREIGHT AND MARKETING COST) ON SALES BY STANDARD AND OTHER COMPANIES IN THE VARIOUS STANDARD MARKETING TERRITORIES, 1915—Continued.

[All figures in cents per gallon.]

5. INDIANA TERRITORY.[1]

Month.	Standard Oil Co. (Indiana.)	Independent refiners.				
		Kansas Cooperative Refining Co.[2]	Indian Refining Co.[3]	Cudahy Refining Co.[4]	Pierce Oil Corporation.[5]	The Texas Co.[6]
January	8.65	8.23	7.10	6.98	6.39	3.59
February	8.30	8.11	6.65	6.87	6.34	2.90
March	8.25	7.73	7.26	6.53	5.93	4.65
April	8.58	7.73	7.61	6.55	5.87	5.78
May	8.52	7.73	7.54	6.55	5.86	5.83
June	7.83	7.00	6.89	5.85	5.27	4.91
July	7.09	6.73	6.87	5.55	5.30	5.86
August	7.17	6.73	6.91	5.60	5.30	5.19
September	7.78	7.50	8.04	6.71	5.88	6.29
October	9.41	8.96	8.59	7.78	7.82	8.33
November	10.85	10.73	10.21	9.38	9.06	9.06
December	12.33	12.41	11.97	11.26	10.90	11.19

Month.	Standard Oil Co. (Indiana).	Independent jobbers.				
		Bartles-Sweney Oil Co.[7]	Wadhams Oil Co.[8]	Hawkeye Oil Co.[9]	Topeka Oil Co.[4]	Bartles-Northern Oil Co.[10]
January	8.65	5.82	7.67	6.95	8.61	8.71
February	8.30	5.98	7.55	6.89	8.11	8.39
March	8.25	6.19	7.17	6.39	8.11	7.82
April	8.58	6.65	7.17	6.38	8.15	7.82
May	8.52	6.82	7.17	6.37	8.15	7.73
June	7.83	5.82	6.60	5.64	7.15	6.97
July	7.09	5.55	6.17	5.36	7.15	6.82
August	7.17	5.63	6.22	5.46	7.15	6.82
September	7.78	6.42	6.87	6.73	8.65	7.62
October	9.41	7.90	9.13	8.07	10.15	9.69
November	10.85	9.50	11.50	10.27	11.65	11.65
December	12.33	11.11	13.35	12.13	13.64	13.43

[1] On quantity discount basis, "net back" would be reduced by 1 cent from Jan. 1 to Nov. 1.
[2] Averages for States of Missouri and Kansas.
[3] Averages for States of Illinois, Indiana, Iowa, Michigan, Minnesota, North Dakota, and South Dakota.
[4] Averages for State of Kansas only.
[5] Averages for State of Missouri only.
[6] Averages for States of Illinois, Missouri, and Minnesota.
[7] Averages for States of Illinois and Iowa.
[8] Averages for State of Wisconsin only.
[9] Averages for State of Iowa only.
[10] Averages for States of Minnesota and North Dakota.

TABLE 35.—"NET BACK" (TANK-WAGON PRICE MINUS FREIGHT AND MARKETING COST) ON SALES BY STANDARD AND OTHER COMPANIES IN THE VARIOUS STANDARD MARKETING TERRITORIES, 1915—Continued.

[All figures in cents per gallon.]

6. KENTUCKY TERRITORY.[1]

Month.	Standard Oil Co. (Kentucky).			Independent refiners.		
	Standard Oil Co. (Indiana).[2]	Standard Oil Co. of Louisiana.[3]	Total.	The Texas Co.[4]	Indian Refining Co.[5]	Gulf Refining Co.[6]
January	9.05	10.54	9.94	7.57	8.24	8.09
February	9.03	10.50	9.91	6.61	7.83	8.14
March	8.98	10.46	9.87	7.57	8.14	8.39
April	8.94	10.37	9.79	7.25	8.47	8.19
May	8.82	10.27	9.68	6.89	8.04	7.80
June	8.71	10.23	9.62	7.85	8.00	7.81
July	8.83	10.17	9.63	7.37	8.21	7.88
August	9.08	10.39	9.86	7.78	8.28	8.50
September	9.80	11.37	10.74	9.22	9.71	9.74
October	10.94	12.46	11.85	10.44	10.73	10.87
November	12.13	13.28	12.08	11.62	11.88	11.96
December	14.35	15.68	15.14	13.47	13.65	13.91

[1] Some allowance must be made for quantity-discount prices, thus reducing the net back slightly.
[2] Averages for the States of Kentucky and Mississippi.
[3] Averages for the States of Alabama, Florida, and Georgia.
[4] Averages for the States of Alabama, Florida, Georgia, and Mississippi.
[5] Averages for the States of Alabama, Georgia, and Kentucky.
[6] Averages for the States of Georgia and Florida.

7. NEBRASKA TERRITORY.

Month.	Standard Oil Co. (Nebraska).	Independent refiners.
		Cudahy Refining Co.[1]
January	7.80	7.23
February	6.44	7.04
March	6.22	6.20
April	7.01	5.73
May	6.81	5.73
June	6.93	5.73
July	6.92	5.73
August	7.16	5.73
September	7.77	6.26
October	9.06	7.46
November	11.17	9.56
December	12.71	12.36

[1] Averages for Omaha, Nebr., only.

TABLE 35.—"NET BACK" (TANK-WAGON PRICE MINUS FREIGHT AND MARKETING COST, ON SALES BY STANDARD AND OTHER COMPANIES IN THE VARIOUS STANDARD MARKETING TERRITORIES, 1915—Continued.

[All figures in cents per gallon.]

8. LOUISIANA TERRITORY.[1]

Month.	Standard Oil Co. of Louisiana.	Independent refiners.		
		Pierce Oil Corporation.[2]	Indian Refining Co.[3]	The Texas Co.[2]
January	7.05	6.60	7.91	6.66
February	6.62	6.24	7.28	6.16
March	6.76	6.19	7.97	6.48
April	6.67	6.07	7.82	6.59
May	6.62	6.04	7.66	6.31
June	6.67	6.32	8.32	7.34
July	7.08	6.67	7.64	7.24
August	7.91	7.38	7.99	7.83
September	10.26	9.44	10.60	10.30
October	11.42	10.96	11.88	11.47
November	11.80	11.29	12.52	11.76
December	12.98	12.90	13.25	12.89

[1] As some reductions were made on sales in large quantities, the true average net back was somewhat less than the figures shown.

[2] Averages for the States of Arkansas and Louisiana.

[3] Averages for the States of Louisiana and Tennessee.

9. MAGNOLIA PETROLEUM CO. TERRITORY.

Month.	Magnolia Petroleum Co.[1]	Independent refiners.				
		Gulf Refining Co.[2]	Kanotex Refining Co.[3]	Pierce-Fordyce Oil Association.[2]	The Texas Co.[1]	Pierce Oil Corporation.[4]
January	2.38	2.07	6.43	2.55	4.08	7.24
February	1.82	1.88	6.09	1.55	3.84	6.92
March	2.32	1.71	4.55	1.37	4.32	6.84
April	3.38	3.27	4.75	1.96	5.20	6.71
May	4.12	4.52	4.69	2.36	5.77	6.62
June	4.81	5.41	4.58	3.11	6.23	6.66
July	5.42	6.00	4.55	3.76	7.68	6.98
August	5.86	6.29	4.41	4.83	7.99	7.60
September	6.93	7.02	5.85	5.47	8.97	8.96
October	8.80	8.72	6.67	7.63	11.34	10.79
November	9.83	10.44	8.24	8.93	12.33	11.48
December	10.54	10.86	8.63	10.40	12.98	13.10

[1] Averages for States of Texas, Oklahoma, and Arkansas.

[2] Averages for State of Texas only.

[3] Averages for States of Oklahoma and Kansas.

[4] Averages for States of Oklahoma and Arkansas.

TABLE 35.—"NET BACK" (TANK-WAGON PRICE MINUS FREIGHT AND MARKETING COST, ON SALES BY STANDARD AND OTHER COMPANIES IN THE VARIOUS STANDARD MARKETING TERRITORIES, 1915—Continued.

[All figures in cents per gallon.]

10. CONTINENTAL OIL CO. TERRITORY.

Month.	Continental Oil Co.[1]	Independent refiners.	
		The Texas Co.[2]	Cudahy Refining Co.[3]
January	9.50	7.61	9.08
February	9.27	6.41	9.08
March	9.38	7.41	9.08
April	9.38	8.18	8.35
May	8.65	8.03	7.13
June	8.39	8.93	6.61
July	8.24	8.84	6.08
August	8.33	8.66	6.14
September	9.71	9.14	7.61
October	11.21	10.30	9.05
November	12.84	10.96	10.91
December	14.80	11.99	13.35

[1] Averages for States of Colorado, Idaho, Montana, New Mexico, Utah, and Wyoming.
[2] Averages for States of Colorado, New Mexico, Wyoming, and Montana (Billings).
[3] Averages for State of Colorado (Denver, Fort Collins, and Pueblo).

11. CALIFORNIA TERRITORY.

Month.	Standard Oil Co. (California).	Independent refiners.				
		Pinal Dome Refining Co.[1]	The Texas Co.[2]	Associated Oil Co.[3]	Shell Co. of California.[4]	Puente Oil Co.[5]
January	8.06	5.20	5.62	5.53	5.65	6.8
February	7.15	4.23	5.30	3.52	5.42	4.6
March	7.11	4.12	4.97	5.82	6.72	4.8
April	7.12	4.12	5.64	6.24	6.11	4.9
May	7.12	4.12	5.61	6.15	5.97	5.3
June	7.12	4.12	3.75	6.76	4.40	5.9
July	6.74	3.73	5.25	6.42	6.15	4.2
August	6.64	3.62	5.40	6.10	5.31	6.2
September	6.91	3.82	5.98	6.31	5.80	7.2
October	8.68	5.93	8.77	7.87	7.57	5.7
November	9.74	6.73	8.61	8.66	7.43	7.4
December	10.62	7.62	10.51	9.16	8.13	7.1

[1] Averages for State of California only.
[2] Averages for State of Arizona only.
[3] Averages for States of California and Oregon.
[4] Averages for States of California, Oregon, and Washington.
[5] Averages for Los Angeles, Cal., only.

TABLE 36.—AVERAGE TANK-WAGON PRICES, RETAIL PRICES, AND RETAIL MARGINS IN REPRESENTATIVE TOWNS IN VARIOUS STANDARD MARKETING TERRITORIES, AND REPRESENTATIVE STATES THEREIN, BY MONTHS, 1915.

[Cents per gallon.]

Month.	1. Standard of New York territory.								Massachusetts.							
	Standard company.				Other companies.				Standard company.				Other companies.			
	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.
January	11.88	12.48	15.04	2.56	10.92	12.51	14.97	2.46	12.69	13.32	15.93	2.61	11.54	13.25	15.47	2.22
February	11.67	12.27	14.92	2.65	10.70	12.30	14.85	2.55	12.36	13.00	15.43	2.43	11.31	13.00	15.11	2.11
March	11.56	12.18	14.85	2.67	10.60	12.19	14.84	2.65	12.36	13.00	15.29	2.29	11.23	12.74	14.97	2.23
April	11.49	12.11	14.86	2.75	10.57	12.17	14.77	2.60	12.36	13.00	15.24	2.24	11.25	12.84	14.97	2.13
May	11.42	12.04	14.70	2.66	10.42	12.03	14.77	2.74	12.36	13.00	15.07	2.07	11.22	12.73	14.97	2.24
June	12.14	12.76	15.02	2.26	11.03	12.65	14.89	2.24	13.16	13.80	15.56	1.76	12.00	13.52	15.13	1.61
July	12.57	13.18	15.25	2.07	11.49	13.11	15.18	2.07	13.36	14.00	15.66	1.66	12.20	13.70	15.34	1.64
August	13.48	14.13	15.99	1.86	12.30	13.99	15.75	1.76	13.94	14.58	16.43	1.85	12.77	14.11	15.51	1.40
September	15.62	16.32	17.59	1.27	14.51	16.12	17.24	1.12	16.16	16.80	18.23	1.43	15.00	16.54	16.95	.41
October	16.67	17.28	18.63	1.35	15.55	17.17	18.43	1.26	17.13	17.77	19.64	1.87	15.98	17.72	18.05	.33
November	18.13	18.73	19.87	1.14	16.87	18.48	19.54	1.06	18.59	19.23	20.77	1.54	17.35	18.86	19.64	.78
December	20.02	20.63	21.63	1.00	18.88	20.50	20.90	.40	20.50	21.13	23.14	2.01	19.41	20.95	21.68	.73

TABLE 36.—AVERAGE TANK-WAGON PRICES, RETAIL PRICES, AND RETAIL MARGINS IN REPRESENTATIVE TOWNS IN VARIOUS STANDARD MARKETING TERRITORIES, AND REPRESENTATIVE STATES THEREIN, BY MONTHS, 1915—Continued.

[Cents per gallon.]

Month.	2. Atlantic Refining Co. territory.								Pennsylvania.							
	Standard company.				Other companies.				Standard company.				Other companies.			
	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.
January	10.32	11.60	14.39	3.39	9.87	11.19	14.21	3.02	10.18	11.00	14.27	3.27	10.30	11.14	14.01	2.87
February	10.32	11.00	14.05	3.05	9.78	11.10	13.84	2.74	10.17	11.00	13.81	2.81	10.28	11.00	14.01	3.01
March	10.29	11.00	13.48	2.48	9.65	10.99	13.71	2.72	10.14	11.00	13.46	2.46	10.21	10.85	13.87	3.02
April	10.29	11.00	13.51	2.51	9.54	10.88	13.51	2.63	10.14	11.00	13.39	2.39	10.08	10.70	13.64	2.94
May	10.29	11.00	13.59	2.59	9.54	10.88	13.30	2.42	10.14	11.00	13.38	2.38	10.06	10.70	13.32	2.62
June	10.29	11.00	13.57	2.57	9.57	10.88	13.37	2.49	10.14	11.00	13.36	2.36	10.09	10.70	13.42	2.72
July	10.29	11.00	13.39	2.39	9.57	10.88	13.16	2.28	10.14	11.00	13.20	2.20	10.13	10.70	13.12	2.42
August	10.81	11.52	13.59	2.07	10.04	11.36	13.54	2.18	10.66	11.52	13.40	1.88	10.57	11.19	13.56	2.37
September	12.66	13.37	15.14	1.77	11.88	13.20	14.97	1.77	12.51	13.37	15.18	1.81	12.28	13.09	15.17	2.08
October	13.29	14.00	16.20	2.20	12.62	13.93	15.93	2.00	13.14	14.00	16.09	2.09	12.95	13.82	16.30	2.48
November	14.72	15.43	17.48	2.05	14.12	15.43	16.99	1.56	14.57	15.43	17.34	1.91	14.30	15.39	17.19	1.80
December	16.71	17.42	19.14	1.72	16.31	17.62	19.09	1.47	16.56	17.42	18.89	1.47	16.33	17.59	19.27	1.68

Month.	3. Standard of New Jersey territory.								New Jersey.							
	Standard company.				Other companies.				Standard company.				Other companies.			
	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.
January	11.44	12.16	14.73	2.57	11.21	12.90	14.61	1.71	8.91	9.00	12.25	3.25	8.01	9.22	11.56	2.34
February	11.22	11.94	14.67	2.73	11.06	12.75	14.54	1.79	8.91	9.00	12.17	3.17	8.01	9.22	11.56	2.34
March	11.16	11.88	14.56	2.68	10.88	12.58	14.49	1.91	8.91	9.00	12.17	3.17	7.91	9.14	11.56	2.42
April	11.10	11.82	14.50	2.68	10.71	12.41	14.40	1.99	8.91	9.00	12.17	3.17	7.84	9.06	11.56	2.50
May	11.15	11.87	14.57	2.70	10.78	12.48	14.37	1.89	9.33	9.42	12.43	3.01	8.20	9.43	11.77	2.34
June	11.21	11.95	14.80	2.85	10.92	12.62	14.50	1.88	10.48	10.57	13.51	2.94	9.32	10.55	12.84	2.29
July	11.33	12.16	14.93	2.77	11.01	12.71	14.57	1.86	11.46	11.55	14.23	2.68	10.30	11.53	13.59	2.06
August	11.83	12.65	15.10	2.45	11.34	13.08	14.86	1.78	12.17	12.26	14.94	2.68	11.00	12.23	14.16	1.93
September	13.71	14.53	16.21	1.68	13.09	14.83	16.23	1.40	14.31	14.40	16.89	2.49	13.08	14.31	16.28	1.97
October	15.64	16.49	18.10	1.61	15.15	16.89	18.07	1.18	15.59	15.68	18.30	2.62	14.48	15.71	17.80	2.09
November	16.42	17.18	19.34	2.16	16.02	17.76	19.17	1.41	17.14	17.23	19.79	2.56	15.94	17.17	19.42	2.25
December	18.67	19.39	20.86	1.47	18.11	19.85	20.45	.60	18.85	18.94	21.30	2.36	17.75	18.97	20.76	1.79

TABLE 36.—AVERAGE TANK-WAGON PRICES, RETAIL PRICES, AND RETAIL MARGINS IN REPRESENTATIVE TOWNS IN VARIOUS STANDARD MARKETING TERRITORIES, AND REPRESENTATIVE STATES THEREIN, BY MONTHS, 1915—Continued.

[Cents per gallon.]

Month.	4. Standard of Ohio territory.								Ohio.							
	Standard company.				Other companies.				Standard company.				Other companies.			
	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.
January	10.47	11.61	13.91	2.30	10.73	11.35	12.81	1.46	10.47	11.61	13.91	2.30	10.73	11.35	12.81	1.46
February	9.86	11.00	13.33	2.33	10.61	11.10	12.82	1.72	9.86	11.00	13.33	2.33	10.61	11.10	12.82	1.72
March	9.86	11.00	13.00	2.00	10.61	11.10	12.88	1.78	9.86	11.00	13.00	2.00	10.61	11.10	12.88	1.78
April	9.86	11.00	12.77	1.77	10.61	11.10	12.88	1.78	9.86	11.00	12.77	1.77	10.61	11.10	12.88	1.78
May	9.86	11.00	12.77	1.77	10.61	11.10	12.80	1.70	9.86	11.00	12.77	1.77	10.61	11.10	12.80	1.70
June	9.36	10.50	12.30	1.80	10.36	10.85	12.44	1.59	9.36	10.50	12.30	1.80	10.36	10.85	12.44	1.59
July	9.36	10.50	11.85	1.35	9.81	10.30	12.02	1.72	9.36	10.50	11.85	1.35	9.81	10.30	12.02	1.72
August	9.01	10.15	11.91	1.76	9.75	10.24	12.10	1.86	9.01	10.15	11.91	1.76	9.75	10.24	12.10	1.86
September	10.28	11.42	13.04	1.62	10.98	11.47	13.14	1.67	10.28	11.42	13.04	1.62	10.98	11.47	13.14	1.67
October	11.80	12.94	14.53	1.59	12.75	13.19	14.63	1.44	11.80	12.94	14.53	1.59	12.75	13.19	14.63	1.44
November	13.73	14.87	16.44	1.57	14.65	15.09	16.35	1.26	13.73	14.87	16.44	1.57	14.65	15.09	16.35	1.26
December	15.99	17.13	18.61	1.48	16.81	17.29	18.74	1.45	15.99	17.13	18.61	1.48	16.81	17.29	18.74	1.45

Month.	5. Standard of Indiana territory.								Indiana.							
	Standard company.				Other companies.				Standard company.				Other companies.			
	Tank-wagon price minus freight.[1]	Tank-wagon price.[1]	Retail price.	Margin.[1]	Tank-wagon price minus freight.[1]	Tank-wagon price.[1]	Retail price.	Margin.[1]	Tank-wagon price minus freight.[1]	Tank-wagon price.[1]	Retail price.	Margin.[1]	Tank-wagon price minus freight.[1]	Tank-wagon price.[1]	Retail price.	Margin.[1]
January	10.33	11.06	12.48	1.42	10.78	11.86	12.67	.81	10.34	11.00	12.46	1.46	10.85	11.65	12.67	1.02
February	10.16	10.90	12.40	1.50	10.58	11.66	12.55	.89	10.22	10.88	12.34	1.46	10.61	11.40	12.74	1.34
March	9.78	10.52	11.94	1.42	10.07	11.15	12.22	1.07	9.84	10.50	11.91	1.41	10.07	10.86	12.27	1.41
April	9.78	10.50	11.83	1.33	9.83	10.91	12.06	1.15	9.84	10.50	11.90	1.40	9.99	10.77	11.88	1.11
May	9.78	10.50	11.77	1.27	9.81	10.89	12.05	1.16	9.84	10.50	11.90	1.40	9.98	10.77	11.82	1.05
June	9.04	9.77	11.20	1.43	9.18	10.26	11.43	1.17	9.04	9.70	11.38	1.68	9.23	10.01	11.25	1.24
July	8.80	9.53	10.76	1.23	8.91	9.99	11.17	1.18	8.84	9.50	10.98	1.48	8.98	9.77	11.15	1.38
August	8.80	9.53	10.73	1.20	8.94	10.01	11.23	1.22	8.84	9.50	10.88	1.38	8.98	9.77	11.24	1.47
September	9.40	10.13	11.13	1.00	9.83	10.91	11.96	1.05	9.44	10.10	11.31	1.21	9.94	10.72	12.36	1.64
October	11.03	11.76	12.56	.80	11.42	12.50	13.32	.82	11.07	11.73	12.93	1.20	11.09	11.87	13.40	1.53
November	12.63	13.36	14.21	.85	13.25	14.33	14.94	.61	12.67	13.33	14.73	1.40	12.91	13.69	14.99	1.30
December	14.48	15.21	16.30	1.09	15.19	16.27	17.02	.75	14.52	15.18	16.67	1.49	15.08	15.86	16.97	1.11

[1] These prices and margins are based on reported prices on quantities of less than 100 gallons. Much gasoline was sold at lower prices between January and December.

TABLE 36.—AVERAGE TANK-WAGON PRICES, RETAIL PRICES, AND RETAIL MARGINS IN REPRESENTATIVE TOWNS IN VARIOUS STANDARD MARKETING TERRITORIES, AND REPRESENTATIVE STATES THEREIN, BY MONTHS, 1915—Continued.

[Cents per gallon.]

Month.	6. Standard of Kentucky territory.								Kentucky.							
	Standard company.				Other companies.				Standard company.				Other companies.			
	Tank-wagon price minus freight.[1]	Tank-wagon price.[1]	Retail price.	Margin.[1]	Tank-wagon price minus freight.[1]	Tank-wagon price.[1]	Retail price.	Margin.[1]	Tank-wagon price minus freight.[1]	Tank-wagon price.[1]	Retail price.	Margin.[1]	Tank-wagon price minus freight.[1]	Tank-wagon price.[1]	Retail price.	Margin.[1]
January	12.64	14.23	14.47	.24	11.50	13.23	14.61	1.38	11.07	12.17	14.39	2.22	10.91	11.92	13.67	1.75
February	12.61	14.20	14.47	.27	11.45	13.18	14.48	1.30	11.07	12.17	14.39	2.22	10.66	11.67	13.29	1.62
March	12.50	14.09	14.45	.36	11.38	13.11	14.47	1.36	10.90	12.00	14.18	2.18	10.43	11.43	13.23	1.80
April	12.41	13.99	14.56	.57	11.26	12.99	14.04	1.05	10.78	11.88	14.07	2.19	10.32	11.32	13.10	1.78
May	12.30	13.89	14.16	.27	11.12	12.85	13.98	1.13	10.51	11.61	13.77	2.16	10.08	11.08	12.94	1.86
June	12.26	13.85	14.28	.43	11.14	12.87	13.96	1.09	10.29	11.39	13.63	2.24	10.24	11.24	13.08	1.84
July	12.24	13.83	14.21	.38	11.29	13.10	14.10	1.00	10.23	11.33	13.50	2.17	10.17	11.17	13.13	1.96
August	12.54	14.13	14.83	.70	11.65	13.46	14.56	1.10	10.44	11.54	13.65	2.11	10.35	11.36	13.21	1.85
September	13.47	15.06	15.77	.71	12.71	14.57	15.24	.67	11.28	12.38	14.27	1.89	11.30	12.21	13.74	1.53
October	14.85	16.43	17.27	.84	14.07	15.94	16.37	.43	12.85	13.95	15.91	1.96	12.85	13.77	14.59	.82
November	15.74	17.33	18.57	1.24	15.08	16.94	17.58	.64	14.11	15.21	17.51	2.30	14.18	15.10	15.93	.83
December	18.18	19.77	19.87	.10	17.42	19.29	19.43	.14	16.90	18.00	19.90	1.90	16.91	17.84	18.76	.92

Month.	7. Magnolia Petroleum Co. territory.								Texas.							
	Standard company.				Other companies.				Standard company.				Other companies.			
	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.
January	8.69	9.83	12.00	2.17	9.84	11.52	11.95	0.43	6.84	8.16	12.00	3.84	7.29	9.46	11.68	2.72
February	8.52	9.67	10.89	1.22	9.46	11.15	11.37	.25	6.68	8.00	10.89	2.89	6.91	9.08	10.81	1.73
March	8.13	9.38	11.67	2.29	9.15	10.84	10.92	.08	6.68	8.00	11.00	3.00	6.83	9.00	10.13	1.13
April	8.40	9.72	11.68	1.96	9.42	11.10	11.13	.03	7.61	8.93	11.37	2.44	7.66	9.83	10.46	.63
May	8.83	10.25	12.00	1.75	9.63	11.31	11.52	.21	8.68	10.00	12.00	2.00	8.49	10.67	11.47	.80
June	8.97	10.43	12.15	1.72	9.69	11.37	11.20	[2].17	9.38	10.70	12.30	1.60	9.06	11.23	11.84	.61
July	9.03	10.50	12.48	1.98	9.76	11.44	11.42	[2].02	9.68	11.00	12.95	2.95	9.49	11.67	12.77	1.10
August	9.75	11.18	12.93	1.75	10.36	12.04	12.26	.22	10.16	11.48	13.37	1.89	10.16	12.33	13.43	1.10
September	11.24	12.59	14.43	1.84	11.41	13.09	13.79	.70	11.51	12.83	14.42	1.59	11.01	13.18	14.42	1.24
October	13.67	14.78	17.57	2.79	13.96	15.64	16.65	1.01	13.42	14.74	16.45	1.71	13.13	15.30	16.41	1.11
November	14.94	16.02	19.19	3.17	15.16	16.84	18.03	1.19	14.75	16.07	17.47	1.40	14.34	16.51	17.77	1.26
December	16.33	17.31	20.30	2.99	16.61	18.30	19.31	1.01	15.68	17.00	19.00	2.00	15.62	17.80	18.98	1.18

[1] These prices and margins are based on reported prices on minimum quantities. Much gasoline was sold at lower prices.
[2] Loss.

TABLE 36.—AVERAGE TANK-WAGON PRICES, RETAIL PRICES, AND RETAIL MARGINS IN REPRESENTATIVE TOWNS IN VARIOUS STANDARD MARKETING TERRITORIES, AND REPRESENTATIVE STATES THEREIN, BY MONTHS, 1915—Continued.

[Cents per gallon.]

Month.	8. Continental Oil Co. territory.								Colorado.							
	Standard company.				Other companies.				Standard company.				Other companies.			
	Tank-wagon price minus freight.	Tank-wagon price	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.
January	12.23	15.71	18.70	2.99	12.65	15.94	19.30	3.36	11.56	14.00	17.17	3.17	12.34	15.00	16.00	1.00
February	12.16	15.64	19.07	3.43	12.65	15.94	19.25	3.31	11.31	13.75	17.17	3.42	12.34	15.00	16.00	1.00
March	11.82	15.30	18.94	3.64	12.55	15.84	19.36	3.52	10.56	13.00	17.17	4.17	12.34	15.00	16.00	1.00
April	11.31	14.79	18.35	3.56	12.37	15.66	19.08	3.42	10.45	12.89	17.16	4.27	12.10	14.76	15.94	1.18
May	10.50	14.12	17.61	3.49	12.19	15.48	18.50	3.02	9.18	11.62	15.76	4.14	11.67	14.33	14.75	.42
June	9.97	13.75	17.21	3.46	12.01	15.30	18.20	2.90	8.90	11.34	15.50	4.16	11.50	14.16	14.67	.51
July	9.73	13.43	17.01	3.58	11.90	15.19	18.07	2.88	8.56	11.00	15.17	4.17	11.34	14.00	14.50	.50
August	9.81	13.49	16.91	3.42	11.91	15.20	17.79	2.59	8.62	11.06	14.86	3.80	11.36	14.02	14.50	.48
September	11.23	14.92	17.81	2.89	12.63	15.92	17.90	1.98	10.06	12.50	15.75	3.25	11.85	14.51	15.34	.83
October	12.72	16.40	19.01	2.61	13.73	17.02	19.26	2.24	11.53	13.97	16.80	2.83	12.87	15.53	16.86	1.33
November	14.62	18.30	21.49	3.19	15.18	18.47	20.79	2.32	13.43	15.87	19.64	3.77	14.19	16.85	18.69	1.84
December	17.10	20.78	24.05	3.27	17.66	20.95	23.28	2.33	15.91	18.35	22.05	3.70	16.66	19.32	21.35	2.03

Month.	9. Standard of Nebraska territory.								Nebraska.							
	Standard company.				Other companies.				Standard company.				Other companies.			
	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.
January	10.64	11.50	.....	.....	13.22	14.34	15.00	0.66	10.64	11.50	.....	.....	13.22	14.34	15.00	0.66
February	10.02	10.88	11.00	0.12	10.93	12.05	13.25	1.20	10.02	10.88	11.00	0.12	10.93	12.05	13.25	1.20
March	9.61	10.47	11.00	.53	12.23	13.35	11.00	[1] 2.35	9.61	10.47	11.00	.53	12.23	13.35	11.00	[1] 2.35
April	9.14	10.00	10.33	.33	11.38	12.50	10.13	[1] 2.37	9.14	10.00	10.33	.33	11.38	12.50	10.13	[1] 2.37
May	9.14	10.00	10.00	.....	11.38	12.50	10.00	[1] 2.50	9.14	10.00	10.00	.....	11.38	12.50	10.00	[1] 2.50
June	9.14	10.00	10.00	.....	11.38	12.50	10.00	[1] 2.50	9.14	10.00	10.00	.....	11.38	12.50	10.00	[1] 2.50
July	9.14	10.00	10.00	.....	11.38	12.50	10.00	[1] 2.50	9.14	10.00	10.00	.....	11.38	12.50	10.00	[1] 2.50
August	9.14	10.00	10.00	.....	11.38	12.50	10.00	[1] 2.50	9.14	10.00	10.00	.....	11.38	12.50	10.00	[1] 2.50
September	9.67	10.53	10.77	.24	12.63	13.75	10.70	[1] 3.05	9.67	10.53	10.77	.24	12.63	13.75	10.70	[1] 3.05
October	10.87	11.73	12.29	.56	14.01	15.13	13.26	[1] 1.87	10.87	11.73	12.29	.56	14.01	15.13	13.26	[1] 1.87
November	12.97	13.83	14.43	.60	16.91	18.03	15.49	[1] 2.54	12.97	13.83	14.43	.60	16.91	18.03	15.49	[1] 2.54
December	15.04	15.90	16.97	1.07	19.78	20.90	16.97	[1] 3.93	15.04	15.90	16.97	1.07	19.78	20.90	16.97	[1] 3.93

[1] Loss.

TABLE 30.—AVERAGE TANK-WAGON PRICES, RETAIL PRICES, AND RETAIL MARGINS IN REPRESENTATIVE TOWNS IN VARIOUS STANDARD MARKETING TERRITORIES, AND REPRESENTATIVE STATES THEREIN, BY MONTHS, 1915—Continued.

[Cents per gallon.]

Month.	10. Standard of Louisiana territory.								Tennessee.							
	Standard company.				Other companies.				Standard company.				Other companies.			
	Tank-wagon price minus freight.[1]	Tank-wagon price.[1]	Retail price.	Margin.[1]	Tank-wagon price minus freight.[1]	Tank-wagon price.[1]	Retail price.	Margin.[1]	Tank-wagon price minus freight.[1]	Tank-wagon price.[1]	Retail price.	Margin.[1]	Tank-wagon price minus freight.[1]	Tank-wagon price.[1]	Retail price.	Margin.[1]
January	10.80	12.18	11.82	[2] 0.36	11.41	13.08	14.03	0.95	10.76	12.33	11.84	[2] 0.49	11.88	13.61	14.38	0.77
February	10.38	11.75	12.00	.25	11.20	12.87	13.59	.72	10.43	12.00	12.33	.33	11.74	13.47	14.09	.62
March	10.19	11.57	11.82	.25	11.00	12.54	13.20	.66	10.43	12.00	12.33	.33	11.48	13.21	13.42	.21
April	10.13	11.50	11.75	.25	10.70	12.38	12.94	.56	10.43	12.00	12.33	.33	11.44	13.17	13.58	.41
May	10.32	11.70	11.85	.15	10.76	11.98	13.08	1.10	10.63	12.20	12.40	.20	11.52	13.24	13.73	.49
June	10.75	12.13	12.13	.....	10.91	12.59	13.40	.81	11.10	12.67	12.67	.....	11.72	13.45	14.03	.58
July	10.75	12.13	12.13	.....	10.70	12.38	13.46	1.08	11.10	12.67	12.67	.....	11.44	13.17	14.03	.86
August	11.70	13.07	12.92	[2] .15	11.32	12.99	13.87	.88	12.04	13.61	13.41	[2] .20	11.99	13.71	14.32	.61
September	13.93	15.31	15.26	[2] .05	13.20	14.85	15.66	.81	14.10	15.67	15.51	[2] .14	13.49	15.19	16.02	.83
October	15.05	16.42	16.44	.02	14.57	16.23	16.92	.69	15.16	16.73	16.75	.02	14.77	16.64	17.43	.79
November	15.47	16.84	16.77	[2] .07	15.19	16.85	17.31	.46	15.63	17.20	17.09	[2] .11	15.69	17.39	17.92	.53
December	16.75	18.12	18.25	.13	16.29	17.95	18.96	1.01	16.84	18.41	18.58	.17	16.66	18.36	19.27	.91

Month.	11. Standard of California territory.								California.							
	Standard company.				Other companies.				Standard company.				Other companies.			
	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.	Tank-wagon price minus freight.	Tank-wagon price.	Retail price.	Margin.
January	10.56	12.27	14.82	2.55	10.88	12.91	15.04	2.13	10.32	10.50	12.33	1.83	9.05	9.86	12.45	2.59
February	9.69	11.41	14.12	2.71	10.04	12.08	14.20	2.12	9.36	9.54	11.69	2.15	8.14	8.95	11.90	2.95
March	9.71	11.42	13.98	2.56	9.88	11.91	14.14	2.23	9.32	9.50	11.53	2.03	8.11	8.92	12.06	3.14
April	9.72	11.42	13.83	2.41	9.84	11.87	14.12	2.25	9.34	9.50	14.83	5.33	8.11	8.92	12.06	3.14
May	9.72	11.42	13.79	2.37	9.84	11.87	14.11	2.24	9.34	9.50	14.83	5.33	8.11	8.92	12.06	3.14
June	9.72	11.42	13.77	2.35	9.84	11.87	13.96	2.09	9.34	9.50	14.83	5.33	8.11	8.92	12.06	3.14
July	9.32	11.02	13.32	2.30	9.45	11.48	13.61	2.13	8.94	9.10	11.13	2.03	7.72	8.53	11.77	3.24
August	9.22	10.92	13.13	2.21	9.34	11.37	13.28	1.91	8.84	9.00	11.04	2.04	7.61	8.42	11.69	3.27
September	9.48	11.18	13.32	2.14	9.69	11.72	13.50	1.78	9.11	9.27	11.13	1.86	7.96	8.77	11.77	3.00
October	11.24	12.94	14.90	1.96	11.49	13.52	15.07	1.55	10.90	11.06	12.63	1.57	9.75	10.56	12.91	2.35
November	12.30	14.01	16.18	2.17	12.64	14.67	16.20	1.53	11.97	12.13	14.09	1.96	10.81	11.62	14.15	2.53
December	13.18	14.88	16.93	2.05	13.70	15.73	16.58	.85	12.84	13.00	14.95	1.95	11.69	12.50	15.03	2.53

[1] These prices and margins are based on reported prices on minimum quantities. Much gasoline was sold at lower prices throughout the year. [2] Loss.

TABLE 37.—MONTHLY AVERAGE REFINERY YIELDS, PRICES, AND LOSSES, SHOWING A COMPARISON BETWEEN CHANGES IN THE COST OF CRUDE OIL AND IN THE PRICE OF THE PRODUCTS SECURED FROM A GALLON OF CRUDE OIL, BASED ON MARKET QUOTATIONS AND AVERAGE YIELDS OF LARGE EASTERN REFINERIES, 1915.

[All figures in cents per gallon.]

Month.	Crude oil cost.[1]	Gasoline (22.03 per cent).		Kerosene (35.28 per cent).		Fuel oil (18.62 per cent).		Lubricating (8.43 per cent).		Weighted average. (Value.)	Loss (7.88 per cent).	
		Price.	Value.	Price.	Value.	Price.[2]	Value.	Price.	Value.		Based on weighted average.	Based on crude oil.
January	2.22	12.13	2.67	10.00	3.53	2.56	0.48	17.50	1.47	9.66	0.76	0.17
February	2.11	12.00	2.64	9.14	3.23	2.49	.46	17.50	1.47	9.25	.73	.17
March	2.01	12.00	2.64	9.00	3.18	2.53	.47	17.50	1.47	9.20	.72	.16
April	1.94	12.00	2.64	9.00	3.18	2.53	.47	17.50	1.47	9.20	.72	.15
May	1.95	12.00	2.64	9.00	3.18	2.52	.47	17.50	1.47	9.20	.72	.15
June	1.94	12.00	2.64	9.00	3.18	2.56	.48	17.50	1.47	9.21	.73	.15
July	1.95	12.16	2.68	9.00	3.18	2.64	.49	17.50	1.47	9.27	.73	.15
August	2.26	13.61	3.00	9.00	3.18	2.68	.50	17.50	1.47	9.66	.76	.18
September	2.68	15.77	3.47	9.00	3.18	3.03	.56	17.67	1.49	10.31	.81	.20
October	2.77	16.77	3.69	9.00	3.18	3.22	.60	18.50	1.56	10.70	.84	.22
November	3.00	18.23	4.01	9.77	3.45	3.39	.63	18.50	1.56	11.44	.90	.24
December	3.39	20.13	4.43	10.00	3.53	3.49	.65	19.75	1.66	12.17	.96	.27
Increase:												
July–December	1.44	7.97	1.75	1.00	.35	.85	.16	2.25	.19	2.90	.23	.12
August–December	1.13	6.52	1.43	1.00	.35	.81	.15	2.25	.19	2.51	.20	.09

[1] Weighted average of quotations of various crudes used.
[2] No satisfactory market quotation on fuel oil being published, the average refinery price of several large eastern refineries has been used.

August–December increases:	
Increase in weighted average	2.51
Increase in value of crude-oil loss	.09
Net increase in value of products	2.42
Increase in crude-oil cost	1.13
Increase in margin of value of products over crude-oil cost	1.29

TABLE 38.—MONTHLY AVERAGE REFINERY YIELDS, PRICES, AND LOSSES, SHOWING A COMPARISON BETWEEN CHANGES IN THE COST OF CRUDE OIL AND IN THE PRICE OF THE PRODUCTS SECURED FROM A GALLON OF CRUDE OIL, BASED ON MARKET QUOTATIONS AND AVERAGE YIELDS OF MID-CONTINENT REFINERIES, 1915.

[All figures in cents per gallon.]

Month.	Crude oil cost.	Gasoline.			Kerosene.			Fuel oil.			Lubricating oil.			Weighted average. (Value.)		Loss.			
		Price.	Value.		Price.	Value.		Price.	Value.		Price.	Value.		Standard Oil of Indiana.	Oklahoma-Kansas refiners.	Based on products.		Based on crude.	
			Standard Oil of Indiana (37.08 per cent).	Oklahoma-Kansas refiners (23.09 per cent).		Standard Oil of Indiana (18.38 per cent),	Oklahoma-Kansas refiners (19.86 per cent).		Standard Oil of Indiana (21.53 per cent).	Oklahoma-Kansas refiners (50.80 per cent).		Standard Oil of Indiana (6.51 per cent).	Oklahoma-Kansas refiners (2.10 per cent).			Standard Oil of Indiana (6.18 per cent).	Oklahoma-Kansas refiners (3.89 per cent).	Standard Oil of Indiana (6.18 per cent).	Oklahoma-Kansas refiners (3.89 per cent).
January	1.31	9.80	3.63	2.26	4.80	0.88	0.95	1.07	0.23	0.54	17.50	1.14	0.37	7.05	4.30	0.44	0.17	0.08	0.05
February	1.07	9.80	3.63	2.26	4.80	.88	.95	1.07	.23	.54	17.50	1.14	.37	7.05	4.30	.44	.17	.07	.04
March	.95	9.80	3.63	2.26	4.80	.88	.95	1.07	.23	.54	17.50	1.14	.37	7.05	4.30	.44	.17	.06	.04
April	.95	9.80	3.63	2.26	4.63	.85	.92	.83	.18	.42	17.50	1.14	.37	6.95	4.14	.43	.16	.06	.04
May	.95	9.80	3.63	2.26	4.30	.79	.85	.89	.19	.45	17.50	1.14	.37	6.89	4.11	.43	.16	.06	.04
June	.95	9.13	3.39	2.10	4.30	.79	.85	.89	.19	.45	17.50	1.14	.37	6.59	3.95	.41	.15	.06	.04
July	.95	8.80	3.26	2.03	4.30	.79	.85	.89	.19	.45	17.50	1.14	.37	6.45	3.87	.40	.15	.06	.04
August	1.50	8.80	3.26	2.03	4.33	.80	.86	.89	.19	.45	17.50	1.14	.37	6.45	3.87	.40	.15	.09	.06
September	1.86	9.50	3.52	2.19	4.83	.89	.96	1.25	.27	.64	17.67	1.15	.37	6.98	4.34	.43	.17	.11	.07
October	1.90	10.99	4.08	2.54	5.41	.99	1.07	1.25	.27	.64	18.50	1.20	.39	7.84	4.84	.48	.19	.12	.07
November	2.14	12.56	4.66	2.90	5.95	1.09	1.18	1.49	.32	.76	18.50	1.20	.39	8.71	5.45	.54	.21	.13	.08
December	2.67	14.86	5.51	3.43	6.30	1.16	1.25	1.85	.40	.94	19.75	1.29	.42	10.00	6.30	.62	.25	.17	.10
Increase:																			
July–Dec	1.72	6.06	2.25	1.40	2.00	.37	.40	.96	.21	.49	2.25	.15	.05	3.55	2.43	.22	.10	.11	.06
Aug.–Dec	1.17	6.06	2.25	1.40	1.97	.36	.39	.96	.21	.49	2.25	.15	.05	3.55	2.43	.22	.10	.08	.04

TABLE 38.—MONTHLY AVERAGE REFINERY YIELDS, PRICES, AND LOSSES, SHOWING COMPARISON BETWEEN CHANGES IN THE COST OF CRUDE OIL AND IN THE PRICE OF THE PRODUCTS SECURED FROM A GALLON OF CRUDE OIL, BASED ON MARKET QUOTATIONS AND AVERAGE YIELDS OF MID-CONTINENT REFINERIES, 1915—Continued.

[All figures in cents per gallon.]

	Standard Oil of Indiana.	Oklahoma-Kansas refiners.
August-December increases:		
Increase in weighted average	3.55	2.43
Increase in value of crude-oil loss	.08	.04
Net increase in value of products	3.47	2.39
Increase in crude oil-cost	1.17	1.17
Increase in margin of values of products over crude-oil cost	2.30	1.22

TABLE 39.—COSTS, WEIGHTED AVERAGE PRICES OF COMBINED PRODUCTS, AND MARGINS PER GALLON OF CRUDE, COMPUTED FROM THE REPORTS TO THE COMMISSION AND THE BOOKS OF REPRESENTATIVE REFINERS, BY MONTHS, 1915. (FOR DISCUSSION, SEE PP. 97-99.)

[All figures in cents per gallon of crude oil.]

1. STANDARD OIL CO. OF NEW YORK.[1] (ATLAS PLANT, BUFFALO, N. Y.)

Month.	Refinery cost.	Crude-oil cost.[2]	Total cost.	Weighted average value.	Loss based on crude-oil cost.	Weighted average value less loss.	Margin between total cost and weighted average value less loss.
January	1.45	3.09	4.54	5.28	0.22	5.06	0.52
February	1.56	3.10	4.66	5.23	.22	5.01	.35
March	1.43	3.09	4.52	5.20	.22	4.98	.46
April	1.48	3.07	4.55	5.15	.22	4.93	.38
May	1.50	2.96	4.46	5.05	.21	4.84	.38
June	1.53	2.88	4.41	5.14	.21	4.93	.52
July	1.45	2.88	4.33	5.10	.23	4.87	.54
August	1.29	2.88	4.17	5.19	.23	4.96	.79
September	1.48	2.89	4.37	5.43	.20	5.23	.86
October	1.41	3.17	4.58	5.49	.26	5.23	.65
November	1.44	3.58	5.02	5.62	.32	5.30	.28
December	1.34	3.67	5.01	5.95	.31	5.64	.63
2. ATLANTIC REFINING CO.[3] (PHILADELPHIA PLANT.)							
January	0.89	3.71	4.60	5.98	0.04	5.94	1.34
February	1.02	3.65	4.67	6.01	.18	5.83	1.16
March	.92	3.51	4.43	5.89	.14	5.75	1.32
April	.87	3.29	4.16	5.39	.11	5.28	1.12
May	.89	3.19	4.08	5.80	11	5.69	1.61
June	.93	3.55	4.48	5.77	.17	5.60	1.12
July	.91	3.44	4.35	5.58	.10	5.48	1.13
August	.84	3.28	4.12	5.87	.24	5.63	1.51
September	.90	3.49	4.39	5.83	.15	5.68	1.29
October	.99	3.63	4.62	6.36	.27	6.09	1.47
November	1.07	4.11	5.18	6.55	.28	6.27	1.09
December	1.32	4.13	5.45	7.32	.28	7.04	1.59
3. COMPANY A.							
January	1.00	4.67	5.67	6.04	0.21	5.83	0.16
February	1.03	4.79	5.82	5.63	.18	5.45	— .37
March	.86	4.67	5.53	6.38	.45	5.93	.40
April	.94	4.52	5.46	6.36	.13	6.23	.77
May	.98	4.54	5.52	6.68	.24	6.44	.92
June	.88	4.59	5.47	7.06	.21	6.85	1.38
July	.94	4.58	5.52	6.44	.27	6.17	.65
August	.86	4.73	5.59	6.90	.29	6.61	1.02
September	.86	5.02	5.88	7.99	.15	7.84	1.96
October	1.01	5.15	6.16	7.39	.36	7.03	.87
November	.99	5.92	6.91	8.42	.19	8.23	1.32
December	.90	5.40	6.30	8.11	.37	7.74	1.44

[1] Refinery cost for first six months was obtained in lump-sum and was therefore necessarily prorated; general and marketing expense for last six months handled in same manner.

[2] In only one case, the Atlantic Refining Co., is any crude equivalent included with crude oil.

[3] In refinery, cost general and selling expenses which were given in lump sum for the entire year were prorated.

TABLE 39.—COSTS, WEIGHTED AVERAGE PRICES OF COMBINED PRODUCTS, AND MARGINS PER GALLON OF CRUDE, COMPUTED FROM THE REPORTS TO THE COMMISSION AND THE BOOKS OF REPRESENTATIVE REFINERS, BY MONTHS, 1915. (FOR DISCUSSION, SEE PP. 97-99.)—Continued.

[All figures in cents per gallon of crude oil.]

4. STANDARD OIL CO. OF OHIO.[1]

Month.	Refinery cost.	Crude-oil cost.	Total cost.	Weighted average value.	Loss based on crude-oil cost.	Weighted average value less loss.	Margin between total cost and weighted average value less loss.
January	1.11	3.18	4.29	4.37	0.26	4.11	−0.18
February	1.18	3.15	4.33	4.36	.25	4.11	− .22
March	1.03	3.16	4.19	4.49	.24	4.25	.06
April	1.11	3.11	4.22	4.43	.24	4.19	− .03
May	1.03	2.90	3.93	4.28	.22	4.06	.13
June	1.10	2.91	4.01	4.03	.22	3.81	− .20
July	1.41	2.85	4.26	4.12	.20	3.92	− .34
August	1.07	2.86	3.93	4.12	.21	3.91	− .02
September	1.20	2.85	4.05	4.27	.18	4.09	.04
October	1.06	2.86	3.92	4.26	.17	4.09	.17
November	1.19	3.01	4.20	5.12	.19	4.93	.73
December	1.20	3.47	4.67	5.55	.21	5.34	.67
5. STANDARD OIL CO. (INDIANA), WHITING PLANT.[2]							
January	1.00	2.69	3.69	5.30	0.10	5.20	1.51
February	1.21	2.55	3.76	5.55	.29	5.26	1.50
March	1.16	2.50	3.66	5.64	.18	5.46	1.80
April	.94	2.44	3.38	5.05	.10	4.95	1.57
May	.81	2.38	3.19	5.05	.17	4.88	1.69
June	.85	2.40	3.25	4.91	.15	4.76	1.51
July	.90	2.42	3.32	4.97	.15	4.82	1.50
August	.92	2.60	3.52	4.96	.19	4.77	1.25
September	.88	3.23	4.11	5.22	.23	4.99	.88
October	.90	3.43	4.33	5.99	.29	5.70	1.37
November	.92	3.43	4.35	6.85	.26	6.59	2.24
December	.93	3.89	4.82	7.45	.13	7.32	2.50
6. STANDARD OIL CO. (INDIANA), SUGAR CREEK PLANT.[2]							
January	0.47	2.36	2.83	3.92	0.08	3.84	1.01
February	.78	2.36	3.14	4.02	.07	3.95	.81
March	1.20	1.98	3.18	4.61	.08	4.53	1.35
April	.85	1.92	2.77	4.31	.00	4.31	1.54
May	.55	2.13	2.68	3.91	.11	3.80	1.12
June	.54	2.08	2.62	4.02	.08	3.94	1.32
July	.69	2.12	2.81	3.99	.09	3.90	1.09
August	.58	2.23	2.81	3.78	.12	3.66	.85
September	.77	2.82	3.59	4.28	.20	4.08	.49
October	.73	3.07	3.80	4.75	.18	4.57	.77
November	.72	3.05	3.77	5.91	.20	5.71	1.94
December	.85	3.20	4.05	7.99	.10	7.89	3.84

[1] The prices used in this table are based on data submitted by company in response to inquiries sent out by the Commission. Refinery cost for the first six months is prorated on six-month basis, as is also the general and marketing expense for the last six months.

[2] Refining cost for first six months prorated; marketing expense for last six months also prorated, as monthly figures were not obtained. Prices and costs in this table do not include refinery shipping expense.

Weighted average value used is based on the average price received by both the Whiting and Sugar Creek plants.

TABLE 39.—COSTS, WEIGHTED AVERAGE PRICES OF COMBINED PRODUCTS, AND MARGINS PER GALLON OF CRUDE, COMPUTED FROM THE REPORTS TO THE COMMISSION AND THE BOOKS OF REPRESENTATIVE REFINERS, BY MONTHS, 1915. (FOR DISCUSSION, SEE PP. 97-99)—Continued.

[All figures in cents per gallon of crude oil.]

7. COMPANY C.[1]

Month.	Refinery cost.	Crude-oil cost.	Total cost.	Weighted average value.	Loss based on crude-oil cost.	Weighted average value less loss.	Margin between total cost and weighted average value less loss.
January	0.23	1.53	1.76	2.73	0.00	2.73	0.97
February	.30	1.29	1.59	2.37	.00	2.37	.78
March	.33	1.15	1.48	2.42	.01	2.41	.93
April	.39	1.16	1.55	2.52	.02	2.50	.95
May	.30	1.14	1.44	2.06	.04	2.02	.58
June	.44	1.17	1.61	2.23	.08	2.15	.54
July	.73	1.16	1.89	2.39	.12	2.27	.38
August	.40	1.73	2.13	2.32	.07	2.25	.12
September	.30	2.11	2.41	2.89	.11	2.78	.37
October	.24	2.27	2.51	3.26	.17	3.09	.58
November	.22	2.49	2.71	3.62	.09	3.53	.82
December	.27	2.68	2.95	4.12	.07	4.05	1.10

8. COMPANY E.

January							
February							
March							
April							
May	0.34	1.19	1.53	2.26	0.05	2.21	0.68
June	.41	1.18	1.59	2.23	.11	2.12	.53
July	.65	1.18	1.83	1.83	.09	1.74	— .09
August	.39	1.61	2.00	2.50	.02	2.48	.48
September	.40	2.12	2.52	2.78	.08	2.70	.18
October	.44	2.29	2.73	3.33	.22	3.11	.38
November	.62	2.63	3.25	4.04	.32	3.72	.47
December	.42	3.09	3.51	4.35	.16	4.19	.68

9. COMPANY B.[2]

January	1.80	1.68	3.48	3.25	0.05	3.20	—0.28
February	1.62	1.56	3.18	3.19	.05	3.14	— .04
March	1.07	1.45	2.52	2.95	.05	2.90	.38
April	.98	1.37	2.35	2.76	.04	2.72	.37
May	.81	1.30	2.11	2.80	.04	2.76	.65
June	.95	1.23	2.18	2.72	.04	2.68	.50
July	.80	1.20	2.00	2.59	.04	2.55	.55
August	.64	1.51	2.15	2.57	.07	2.50	.35
September	.75	1.96	2.71	3.31	.05	3.26	.55
October	.70	2.09	2.79	3.67	.05	3.62	.83
November	.71	2.25	2.96	3.51	.06	3.45	.49
December	.61	2.53	3.14	4.15	.14	4.01	.87

[1] General and selling expenses were given in lump sum by months for several refineries; figures for two refineries were arrived at by prorating the total on the basis of crude run.

[2] The operating expenses in refinery cost were secured for three-month periods and have been prorated.

TABLE 39.—COSTS, WEIGHTED AVERAGE PRICES OF COMBINED PRODUCTS, AND MARGINS PER GALLON OF CRUDE, COMPUTED FROM THE REPORTS TO THE COMMISSION AND THE BOOKS OF REPRESENTATIVE REFINERS, BY MONTHS, 1915. (FOR DISCUSSION, SEE PP. 97-99)—Continued.

[All figures in cents per gallon of crude oil.]

10. COMPANY D.[1]

Month.	Refinery cost.	Crude-oil cost.	Total cost.	Weighted average value.	Loss based on crude-oil cost.	Weighted average value less loss.	Margin between total cost and weighted average value less loss.
January	0.59	1.65	2.24	2.59	0.06	2.53	0.29
February	.90	1.37	2.27	2.48	.02	2.46	.19
March	.87	1.14	2.01	2.41	.02	2.39	.38
April	.70	1.15	1.85	2.34	.00	2.34	.49
May	.61	1.17	1.78	2.18	.02	2.16	.38
June	.68	1.27	1.95	2.13	.07	2.06	.11
July	.61	1.22	1.83	2.15	.04	2.11	.28
August	.82	1.62	2.44	2.26	.07	2.19	— .25
September	.74	1.97	2.71	2.70	.11	2.59	— .12
October	.64	2.16	2.80	3.30	.13	3.17	.37
November	.76	2.69	3.45	4.01	.11	3.90	.45
December	1.06	2.75	3.81	4.55	.08	4.47	.66

11. GULF REFINING CO., PORT ARTHUR PLANT.[2]

January	0.42	2.52	2.94	3.34	0.06	3.28	0.34
February	.43	2.12	2.55	3.23	.07	3.16	.61
March	.39	2.16	2.55	3.36	.08	3.28	.73
April	.35	2.14	2.49	3.14	.08	3.06	.57
May	.34	2.08	2.42	3.45	.08	3.37	.95
June	.39	2.02	2.41	2.68	.09	2.59	.18
July	.35	1.98	2.33	2.35	.07	2.28	— .05
August	.35	2.42	2.77	2.38	.12	2.26	— .51
September	.35	2.55	2.90	2.45	.11	2.34	— .56
October	.30	2.48	2.78	3.01	.05	2.96	.18
November	.40	2.73	3.13	2.65	.06	2.59	— .54
December	.48	3.12	3.60	2.96	.12	2.84	— .76

[1] In refinery cost the operating expense for the first six months was obtained as lump-sum figure, and is prorated to secure the total monthly refinery costs.

[2] In refinery cost, depreciation has been divided between Port Arthur and Fort Worth plants on the basis of plant investment. The Port Arthur amount has been divided on the basis of six-month figures given for both plants and prorated by six-month periods. Income and corporation taxes given for six-month periods and prorated.